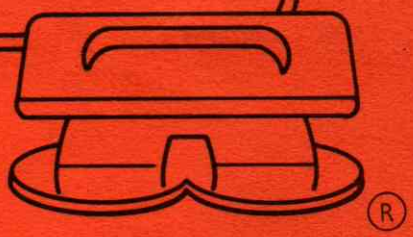
Margaret Luff

KNITTING MACHINE

WORKBOOK NO. 1



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BASIC TECHNIQUES

BY

TAMI NOBUYUKI

Knitting Machine Workbook No. 1

Basic Techniques

Revised Edition

By

Tami Nobuyuki

ADULT EDUCATION
NO. ORANGE COUNTY COMMUNITY COLLGE DIST.
FULLERTON, CALIF. 92634

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PREFACE

With the growing number of machine knitters and would-be knitters, the doors to the public schools are being opened. In recent years, there have been many machine knitting classes offered through adult education in California.

Since coming into the adult education system, I have searched for appropriate text books or a curriculum to follow. While there are many books available, few were appropriate for classroom usage.

It was not very long before I realized I had to develop my own curriculum in order to teach this subject in an organized manner. The instruction must be given for many models and brands of machines at the same time in a classroom situation. The instruction sheets prepared each week for my students for their classroom use were well received.

Before long I began to receive requests to share my instruction system. This book is compiled as a result of these requests. The overall structure is the same; however, much of the explanations and demonstrations given in the classroom are now included in this workbook.

Much of the contents may seem somewhat repetitious. However, it is intended to give students working experience through repetitious drills with an introduction of new techniques at the same time. This has been proven to be effective. Even the brand new students who have not seen a knitting machine before coming to my class have rapidly learned to handle their knitting machine expertly.

I also kept in mind those who must learn on their own; who live in the areas where there are no adult education classes available, and those who live where there are no other knitters to give assistance and share ideas.

I fell in love with knitting machines, and machine knitting changed my life. It is fun to knit and it challenges one's creativity. It continues to fascinate me as time goes by. I hope you find it fun to knit and love it.

As for help with this book, I wish to thank Messrs. Charles Lacour, Robert Hauser, Mmes. Nancy Nelson, Jacqualyn Hilsen and Dotty Kneedler and all others who helped me in many ways. My deepest appreciation goes to my husband, Art for his contribution and encouragement when I needed it most. For putting up with inconveniences and preparing his meals for all summer long, I thank our son, David. And above all, I thank God for making it possible.

Fami

September 1977

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Abbreviations

B.O.	Bind off
Cam	Carriage
C.C.	Contrasting color
Ch	Chain
Cm	Centimeter
C.O.	Cast on
Dc	Double crochet
Dec(s)	Decrease(s)
Ea.	Each
E/N	Every needle
E/O/N	Every other needle
E/O/R	Every other row
E/R	Every row
E/S	Every stitch
F/F	Full fashion
Hdc	Half double crochet
H.P.	Holding position
Inc(s)	Increase(s)
K	Knit
L	Left
M.C.	Main color
M.P.	Middle position
N.W.N.	Non-working needle
N.W.P.	Non-working position
P	Purl
P.U.	Pick up
R	Right
R.C.	Row counter
r/c	Ravel cord
Sc	Single crochet
S/R	Short row
Sk.	Skip
Sl. st.	Slip stitch
St. (sts.)	Stitch (stitches)
St. st.	Stockinet stitch
Ten.	Tension
T.O.	Take off (remove sts.)
Tog.	Together
W.N.	Working needle
W.P.	Working psotion
W.Y.	Waste yarn (scrap yarn)

CHAPTER 1 LET'S GET ACQUAINTED WITH OUR KNITTING MACHINE

Unless you know your knitting machine you are not going to be able to get the best service from it. Every knitting machine should come with a manual which explains in detail what the parts are, how they work and how to operate them. Read your manual carefully so you become familiar with your machine's specific names and terminology so you can refer to it whenever you have a problem or a question. Naturally, there will be problems and questions that your manual does not cover, but you will find yourself handling these without trouble as your skill and familiarity with your knitting machine increases.

First, let's discuss some of the basic parts that are fundamental to almost any knitting machine. As we mention each item, refer to the appropriate section of your manual so you can jot down, in the space provided, the page number and other necessary information. This will give you a quick reference on any item.

A. Tension Dial: A large round dial at the center of the carriage.

1. This mechanism regulates the size of the stitches.

2. The larger the number, the larger (or looser) the stitches are going to be; the smaller the number, the smaller (or tighter) the stitches will be.

3. There are two small stops (notches) between the numbers which adjust to make very slight changes in the size of stitches. They will be referred to as ".1" for the stop closer to the smaller number, and ".2" for the stop closer to the larger number. The first stop past 4 toward 5 will be 4.1, and the second stop past 4 toward 5 will be 4.2.

Refer to Page No. 5 of your manual.

B. Dial(s) on Tension Pole: There are two little knobs (or dials) which turn at the top of the tension pole with spring(s) inside. This unit is called by various names, such as auto tension, automatic yarn tension, tension unit, or upper tension. They all refer to the same thing. The functions of this unit are:

1. Works the same way as the tension setting of your sewing machine.

2. Regulates the flow of yarn. The tighter the setting, the slower the yarn flows; the looser the setting the faster the yarn flows.

3. Regulates the yarn tension between the dial on the tension pole and the tension dial on the carriage. Changes in the settings of either the tension dial or tension pole will affect stitch size and therefore change the stitch and row gauge.

Refer to Page No. 3 & 11 of your manual.

C. Needle Positions: On each end of the needle bed you will notice markings with Letters A, B, C, and so on. On some machines there are more letters than others. These indicate the ranges or areas for needle positions. Each needle position has certain functions to perform in connection with the cam levers. If the cam levers are set in the position for stockinet knitting, it will knit regardless of the needle position, as long as the needles are brought out of "A" position. However, once one of the settings on the cam is changed the needle positions make the difference between knitting and not knitting, or worse yet, dropping all the stitches.

Since there are multiple purposes for each needle position and space is limited, letters are assigned to each area. As mentioned earlier, each area or position has functions to perform; you must be familiar with them in order to understand the working of your knitting machine.

Take a look at your knitting machine and list the letters you find on your machine in the space provided.

Position	Description	Page No. 4
N.W.P. A	NON WORKING POSITION (NEEDLES AT REST)	
W.P. B	POSITION FOR PLAIN KNITTING.	
M.P. C	ALSO PLAIN KNITTING (WHEN RETURNING KNITTING STITCHES FROM E ONTO F	
D	POSITION OF SELECTED NEEDLES.	
E	POSITION OF PUSH-UP KNITTING.	
H.P. F.	POSITION OF NEEDLES HOLDING SETS WHICH DO NOT REQUIRE KNITTING.	

Now, look into your manual and see if you can find any description or explanation regarding the needle positions. Write the information on the above lines. Also, fill in the page number where you found this information for future reference.

All the Japanese made machines have certain needle positions which are common. The following is the simplest explanation of them and their functions:

"A" Position--Non-working position (N.W.P.). This is the position where the unused needles must remain. The needles to be used should be brought out of this position. Any needles brought out of this position, on purpose or by accident, will knit.

"B" Position--Working position (W.P.). This is the area or position where the needles are lined up while working in stockinet, and most pattern work.

Holding Position--(H.P.) Regardless of the letter assigned to this position, it is the farthest position from "A" on the needle bed. Some machines will have "D" for this position. Others might have "E" or even "F". Whichever letter you find on your particular machine for this area, it is the position for holding.

Middle Position--(M.P.) When most of the knitting machines had A, B, C, and D positions, they were always: "A" for non-working, "B" for working, "D" for holding and "C" for middle position. However, some of the newer machines with more features have more needle positions. Other newer machines have fewer needle positions and different ways of lettering these positions. Therefore, it is incorrect to list "D" for holding and "C" for middle position. Regardless of the letter(s) assigned to this position, the area between "B" and holding position can all be properly called "middle position."

This middle position is used mainly for bringing the needles from holding position into working and pattern work positions. With a proper cam lever setting you will be able to keep the necessary needles in holding position, and knit only those you wish to knit. Up until several years ago, this position was labeled "C" on most of the machines manufactured in Japan. Therefore, you will notice many machine knitters referring to this position as "C" position even though some of the newer knitting machines may have "D" or "E" on the needle bed. You will also notice many of the machine knitting instructions and patterns may have the term such as "bring into C position," "push into C," or "knit C and B position." All of these refer to this middle position.

D. Cam Levers: These are the devices to tell the carriage (cam) what to do: to knit or not knit stitches on the needles in a certain position. By combining the positions of the needles, levers and buttons, you can knit certain stitches, keep some stitches in holding position, or put some of the holding stitches back into working position.

Each machine comes with different features and uses different names for devices which may all do the same job. They may be the same device, labeled with the same name but located at a different place on the cam, or located at the same place and numbered in reverse, but all the machines have the following, no matter what they may be labeled or where they may be located:

1. Knitting any position: To knit all the stitches in any position, except the needles in "A" position (non-working position).

2. Holding: To knit the stitches on the needles in "B" (working) position only. Stitches in M.P. will be moved out to holding position automatically as the cam passes. Holding position needles will remain out.

3. Partial knitting: To knit the stitches on the needles in "B" position and the middle position, but not the ones in holding position. One of the main functions of the middle position is to bring the holding needles into work. However, this can be accomplished only when the levers and buttons on the cam are set properly for this job. Remember, only the combination of the correct cam lever setting and the proper needle position will enable you to do this.

   Look through your manual and find the names of these devices and the proper setting for your particular machine. Write the information from your manual in the blank spaces provided.

   Some machines have only two lever settings: One for knitting any position (except "A" position), and another for knitting only those needles in working and middle positions. If the needles are in the middle position or anywhere near the middle position, they will be knitted along with those in working position. This is the same as having only settings 1 and 3 as explained above.

   Also, there are some machines which have two separate levers for the movements of the cam: one for the movement of the cam from left to right, and another one for right to left. There are other machines which come with only one lever controlling the mechanism for both directions.

   When there are separate levers for left and right, the left controls movement to the left, and the right controls movement to the right. If the cam is to move toward the left on the next move, the lever which is at the left side of the cam is the one that should be used. It does not matter what setting you have on the right side of the cam. The reverse is true with the movement going to the right on the next move. If you have one lever to control the movements for both directions, set it for the next movement, whichever the direction may be.

Cam Lever Setting	Function(s)
_____	_____
_____	_____
_____	_____

   Do you have one cam lever to control the movements of the cam to left and right, or two separate controls for each direction?

   One control_____ Two separate controls_____

   Refer to your manual, Page No. 4

E. Cam Buttons and Levers: In addition to the cam levers, there are more levers and/or buttons on your carriage. "What are these buttons for?" and "What do these buttons do?" are the questions most frequently asked by the new knitters.

The needles may be selected for pattern stitches by means of buttons (needle selection buttons), punched card or manually. But it is the carriage that does the knitting as it moves across the needle bed. If the cam does not have the proper setting, it will not do the job you want it to do.

By setting the cam lever in the proper place and/or pushing the right buttons on it, you can tell the cam what to do.

Let's look at your carriage and list what you see.

Buttons and/or Levers	Functions	Page No. 4 & 5
CAM BUTTONS	Coloured figure patterns, slip st. patts, tuck patts.	
Auxiliary Cam Buttons	Simple cast on, d. st., tuck patterns	
Tuck buttons	Used for knitting tuck patterns	
Pull up knobs	■ Pull up position ◆ Normal position	
Returning levers	■ Pull up patterns, needles holding stitches need to remain at F position ● Shaping in pull-up patterns to bring needles in D and E back to B, but leave needles in F unmanned ◆ To bring needles from D, E, & F back to B also for plain knitting patterns not using pull up knobs	

Look into your manual and see what is said about each of these buttons and levers. Write down as much as you can find about them in the space provided above. Also write down the page number on which you found the information.

F. Care of the Knitting Machine: It is important for you to keep your machine clean and oiled. When the machine is in good condition, you can do a better job, and it will be easier to work on it. Clean it and oil it at least once a week. Check with your instruction manual for details.

Refer to Page No. ____ of your manual.

Now that you have been introduced to your knitting machine and the manual, let's start knitting and gain working knowledge through experience.

In the following chapters, you are going to make samples of different techniques required in making different garments and articles. After making each sample, block it and place a sticker or a tag on it with the sample number to identify the technique used. You may want to attach your samples to heavy paper and file them in a loose-leaf binder. They will be readily available for future reference.

CHAPTER 2 TIPS AND TECHNIQUES

HELPFUL HINTS

1. CHECK ALL KNOBS, DIALS, ETC. for normal or neutral setting before starting to work on the machine.

2. KNIT WITH AN EVEN SPEED. Moving the carriage fast one row and slow the next will result in uneven knitting and an erratic gauge.

3. LISTEN FOR THE "CLICK" at the end of each row. When you hear this "click", the cam is clear to return to the other side. If you return the cam before hearing the "click", the next row will not knit or the work may fall off the machine.

4. DO NOT MOVE THE CARRIAGE TOO FAR past the edge of the work. The extra length of yarn will make the first stitches of the next row too loose, wrap around a sinker post or get tangled in the brushes on the underside of the cam plate.

5. ALWAYS BEGIN WORK ON THE SAME side of the needle bed to minimize confusion. By starting and ending on the right side, you can expect an even number on the row counter when the cam is on the right and an odd number when the cam is on the left.

6. KNIT MATCHING OR REVERSED shaped piece, such as sleeves, bodice fronts, etc., one after the other. You will make fewer mistakes, if any, on the second piece. It will go much faster and easier since the numbers for the first piece are still fresh in your mind.

7. STRETCH THE KNITTED PIECE lengthwise as soon as it comes off the machine. This will help it settle in a normal, natural shape. Don't be afraid to overstretch it. The stitches have been stretched sideways while you were knitting on the machine and will settle with ridges between them if they are not pulled into shape.

SWATCH AND STITCH GAUGE

Stitch gauge is the basis for calculating the accurate number of stitches and rows required to make a garment fit a specified size and shape. The swatch is a sample piece knitted in exactly the same way as the actual garment in order to determine the stitch gauge as well as the behavior of the material used.

The importance of having a correct stitch gauge and row gauge for charting cannot be overemphasized. Much of the difficulty encountered in the fit of

knitted garments is due partly to an inaccurate stitch gauge. Remember that it does not matter what tension is set on the dial of your machine as long as you use the same stitch gauge and row gauge specified for the particular item you are making. If you are trying to match exactly a pattern created by someone else, you may have to change your tension several times before getting the gauge specified in the pattern. This is because all machines are not the same; the yarn may be slightly different from dye lot to dye lot even with the same yarn. And all knitters knit differently.

A swatch of 100 stitches and 100 rows is recommended for most garments. It will be large enough to be blocked and to take an accurate measurement for 40 stitches and 60 rows in the center.

Also, when you are planning to make something in pattern stitches, it is a good idea to make a practice piece to get used to the pattern work. If you can knit 100 rows without dropping stitches or having any other problems, you should be able to make whatever you are planning without too many problems.

The difference in knitting speed makes a difference in the stitch gauge. This will cause a difference in the measurements you have charted and those of the actual finished garment. Knit your swatch at the speed you will knit the actual garment and maintain an even speed as you knit.

Be sure to note the tension you use to knit your swatch. The easiest way to do this is to use eyelets at the bottom edge (outside the critical 40 sts. and 60 rows) of the swatch. Each eyelet hole represents a number on the tension dial and each notch between them. A swatch with eyelets arranged ooo o means tension 3.1. The 3 eyelets to the left mean the large number 3 on the dial and the eyelet after the space to the right--one notch. With lace and pattern swatches, add a few extra rows of stockinet at the bottom to record your tension.

Stitch and row gauges are usually given as a number of sts. and rows equalling 1", 2", 4" or 10 cm. Use whichever base measurement that is most convenient and comfortable for you when you are charting your own patterns. When using someone else's patterns, be sure to note which base is used as they vary from pattern to pattern.

Making a swatch

1. With main color (garment yarn), cast on 100 sts. using one of the permanent C.O. methods. Knit 12 rows at tension you are going to use for the garment.

2. Make eyelets for tension no. and setting on tension pole. For example, make 4 eyelets for tension 4, 6 eyelets for tension 6, etc. Knit 6 more rows. (Row 18)

3. Change to a contrasting color yarn of the same weight as the garment yarn. Knit 2 rows. (Row 20)

4. Place a marker on the sinker loop (bar between stitches) between needles No. 20 and 21 on each side of 0.

5. Change to the garment yarn and knit 30 rows and place markers in the same position. (Row 50) Knit 30 more rows and place markers again.

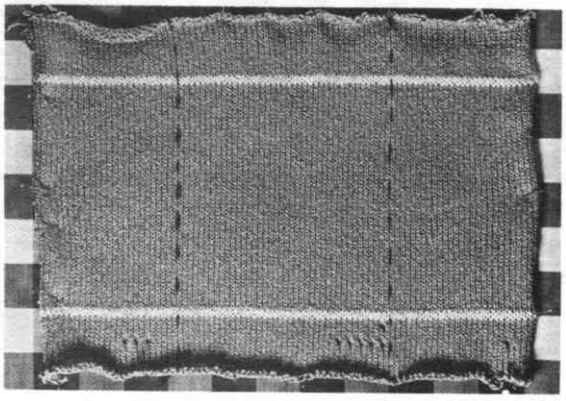
6. Knit 2 rows with a contrasting color yarn of the same weight and change to main color. Knit 18 more rows and bind off. (Row 100)

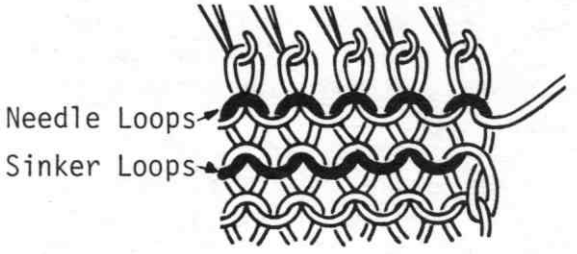
7. Remove from the machine. Immediately after removing from the machine, stretch the swatch lengthwise. Inside the markers is a sample of 40 sts. and 60 rows.

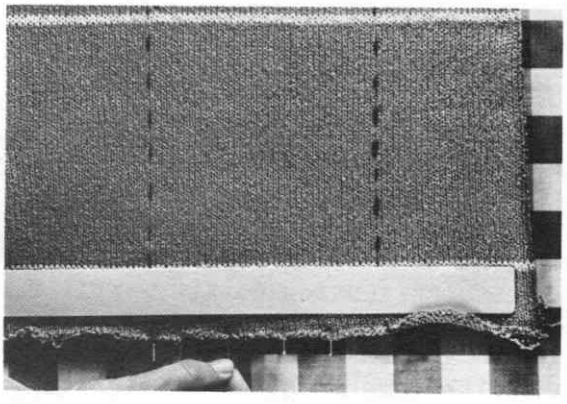
Taking a stitch Gauge

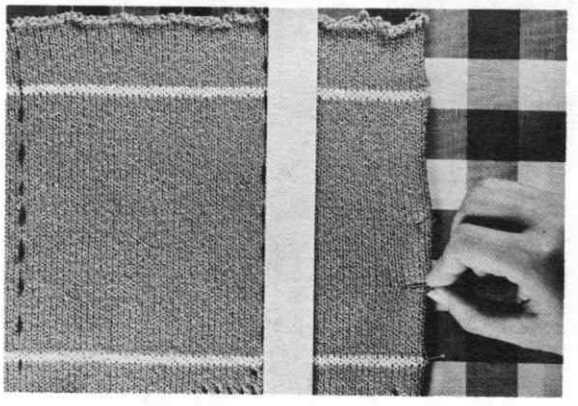
1. Going into the ridge, make a running stitch on each side of the 40 stitches marked. The running stitch should go over the markers in 3 places. Remove the markers.

2. Block the swatch with a steam iron. If necessary, place a ruler along the running stitch and contrasting color to straighten the work and pin on the outside of the work.



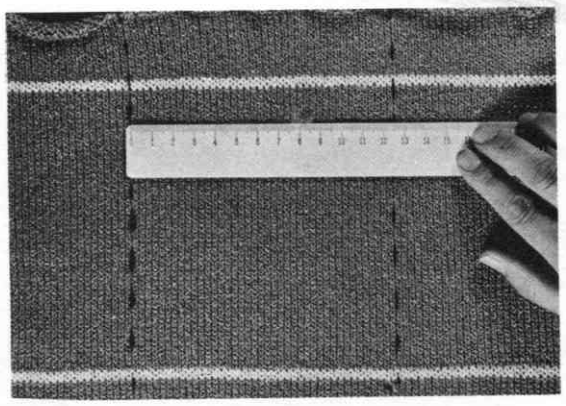


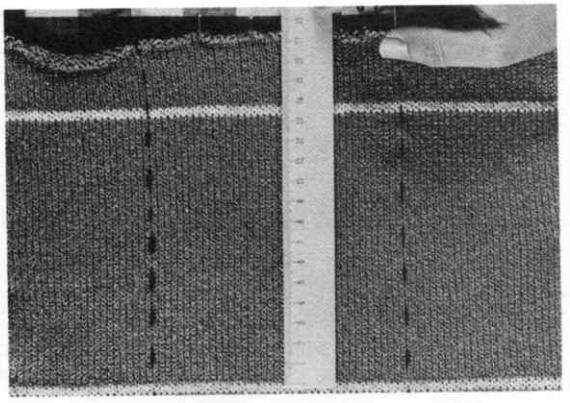




3. Determine the stitch gauge and row gauge according to the procedure shown in the instructional manual which came with your own charting device., i.e., Knit Leader, Knit Tracer, Knit Copy or Knit Radar (or Contour).

   Refer to your manual, Page No. _____





4. If you do not have a charting device, measure the swatch with a metric ruler, making sure you measure only the stitches and rows inside the markers. This will give you the figures in cm. for 40 sts. and 60 rows.

   a. To determine the no. of sts. per cm, divide the 40 sts. by the no. of cm that it measures.

      Example: 40 sts. = 12.9 cm
      40 ÷ 12.9 = 3.1 (sts. per cm)

   b. To determine the no. of rows per cm, divide 60 rows by the no. of cm it measures.

      Example: 60 rows = 15.0 cm
      60 ÷ 15.0 = 4.0 (rows per cm)

   c. To find the gauge for 4" or 10 cm multiply the no. of sts. or rows per cm by 10.

      Example: 3.1 (sts. per cm) x 10 = 31 (sts. per 10 cm or 4")
      4.0 (rows per cm) x 10 = 40 (rows per 10 cm or 4")

   d. To convert inches into cm multiply the no. of inches by 2.54.

      Example: 12" x 2.54 = 30.5 cm

e. To convert cm into inches divide the no. of cm by 2.54.

Example: 66 cm ÷ 2.54 = 25 inches

f. Once you have the gauge you can easily chart the no. of stitches and rows needed for the item you want to make. Multiply the necessary measurement by the no. of sts. or rows in your gauge. Knit according to your calculations.

5. After recording the stitch gauge and row gauge, wash and dry the swatch as you would the finished garment in order to determine the shrinkage. Follow the manufacturer's recommendations regarding the method of cleaning. For a material which requires dry cleaning, it is not necessary to dry clean the swatch for this purpose. However, be sure to let it stand for several hours to let it shrink back to its natural size and shape, after it has been removed from the machine.

6. Take the stitch gauge and row gauge again after washing and drying and compare them with the first set taken before washing. If you have two different sets of figures, the gauge obtained after washing must be used for charting. In such a case, the finished garment will not be the right size and shape you inteded it to be until it is washed and dried in the same way as the swatch.

RIPPING OUT

From time to time you will come to a point when you must rip out one or more rows. You will regret it later if you do not correct your mistakes when you find them.

1. Ripping out only 1 row on the machine--from right to left:

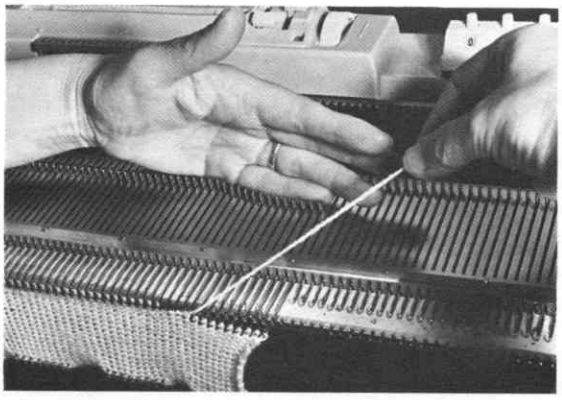
a. Line up the needles in "B" position by pushing the needle butts as far back as they will go.

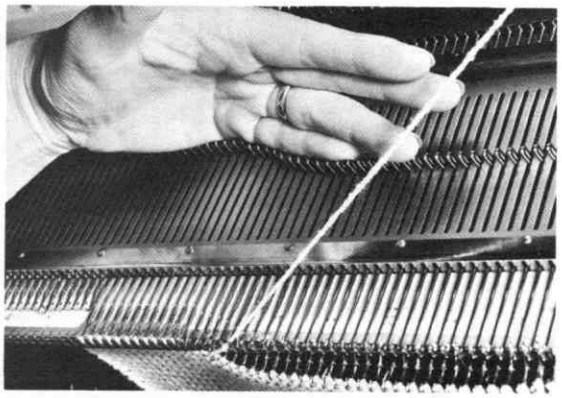
b. Remove the yarn from the yarn feeder of the cam.

c. With your right hand, pull the yarn attached to the garment to the right and away from you. With your left hand, bring the needle butts slightly forward as the yarn is being pulled away from the hook.

NOTE: As you push the needle butts forward, do not push them too far or too fast. Bring them out just enough to release the stitches from the hook.

d. Keep ripping in this manner to the left until the entire row is ripped out. Practice to get better coordination.





e. Line up the needles back in "B" position. Yarn is at L and the cam is at R.

f. Set the cam for free pass and slip the cam across.

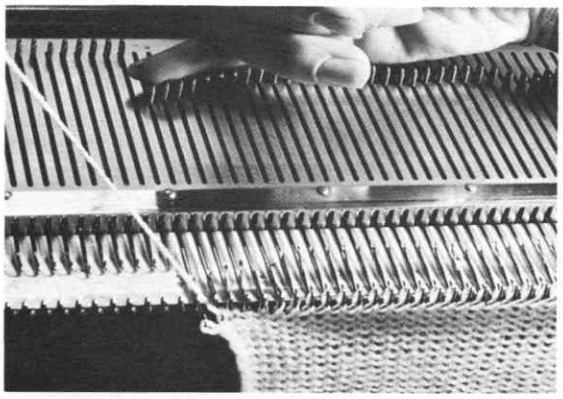
g. Feed the yarn back in the yarn feeder of the cam plate.

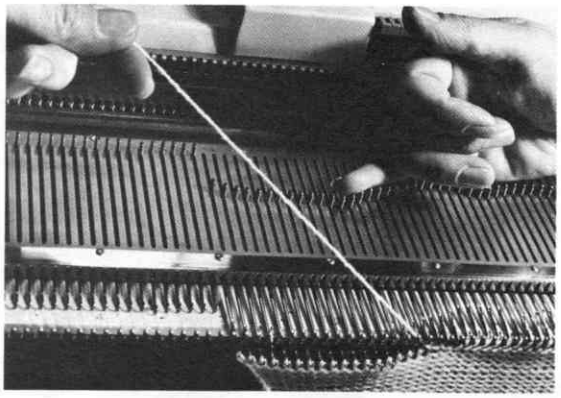
h. In order to maintain the even tension on the next row, pull the ripped yarn down behind the tension pole.

i. Turn the row counter back by 2; 1 for ripping out, and another for free pass in which the row counter registered 1 row. Resume knitting.

2. Ripping out only 1 row on the machine--from left to right:

Proceed in the same manner as No. 1, reversing directions and hand positions.





3. Ripping out more than 1 row at a time:

   a. Remove the yarn from the yarn feeder of the cam.

   b. Rip out as many rows as required by following the same procedure described in 1 and 2.

   c. Turn the row counter back by the number of rows ripped out.

   d. If the cam is on the other side of the work when you finished ripping out the necessary amount, slip it across without knitting. Turn the row counter back by 1 more.

   e. Pull the yarn down behind the tension pole. Feed the yarn back in the yarn feeder of the cam. Reset the cam and resume knitting.

4. Ripping more than several rows:

   When there are many rows to rip out, it is easier and faster to remove the entire work from the machine. Rip out the necessary amount and rehang the work on the machine. Following is a procedure:

   a. Place a marker on the actual row to which you must rip back. Use running stitch with a contrasting yarn.

   b. Remove the entire work from the machine.

   c. Rip out to 2 or 3 rows above the marker made in Step a.

   d. Rehang the work on the machine and rip down to the marker row on the machine.

   e. Reset the row counter and resume knitting.

TROUBLE SHOOTING

1. WHEN YOU RUN OUT OF YARN in the middle of a row:

   a. Rip back to the beginning of the row and make a knot:

      1) Loosen the screws on the cam plate and remove it. Move the cam back to the beginning of this particular row by lifting the cam slightly. Rip back to the beginning of the row.

      2) Line up the needles in the proper position. Reset the row counter if necessary.

      3) Screw down the cam plate and feed the new yarn through the yarn feeder. Hold down both pieces of yarn (old and new) together and knit this row.

4) Tie a square knot where the 2 strands are hanging loose. Use this extra yarn for seaming.

b. Tying a knot in the middle of a row:

1) Remove the yarn from the yarn feeder of the cam where it is stopped. Do not move the cam.

2) Feed the new yarn through tension pole and yarn feeder.

3) Hold onto the old and new yarn under the cam and knit the rest of the row.

4) Tie a square knot where the yarn was changed before knitting another row.

NOTE: This method can be used only when you have noticed the yarn running out in time. Once you have run out of yarn completely and begun to drop stitches, it is too late.

2. WHEN YOUR WORK IS CURLING, floating or losing stitches use ample claw weights to pull it down. Cast-on combs are handy to help hang the weights evenly across the work. Hook the teeth of the comb into the work and hang the weights on. Using weights is especially important when you are knitting in pattern stitches, lace work and short rows.

3. WHEN THE CAM GETS STUCK in the middle of the row, don't panic and try to force it in either direction.

a. Check the yarn to see if it is tangled anywhere.

b. Loosen the screws and remove the cam plate.

c. Bring the cam back to the side you began this row, either by slipping or removing it from the needle bed.

d. Correct the problem.

e. Set the cam in its proper position and screw the cam plate down securely.

f. Line up the needles in the proper position, and rip out any stitches to bring the yarn to the cam side.

g. If the row counter has advanced, set it back to the correct number.

h. Resume knitting.

Refer to your manual, Page No._____

4. WHEN THE CARRIAGE IS TIGHT and squeaking, oil your machine. Apply oil on the rail of your needle bed. Lightly spray a metal lube on the underside of the carriage.

   Refer to your manual, Page No._____

Now you are ready to make samples. The materials you need are various colors 2/11 or 2/12 orlon yarn and crochet cotton to use as ravel cord.

CHAPTER 3 CASTING ON

A. Open Cast-On, Open End Cast-On, Open Edge Cast-On: They all mean the same thing. It is one of the quickest and easiest ways to cast on stitches. However, it may unravel from the bottom given a chance. This method is used mainly in starting with waste (or scrap) knitting or in making swatches. It can be used for starting a garment if the edge is going to be finished with some kind of trim or turned up as a hem.

Turn to your manual and find the page which explains this procedure. Enter the page number as you follow the instruction.

1. Set up your knitting machine according to your manual. Page No.___

2. Thread the yarn through tension control and yarn feeder on the carriage (or cam).

   Page No.___

3. Place the cam at right.

4. Set your cam according to the manual and copy the information into the blank spaces provided for each. Cross off any of the following which does not pertain to your own machine.

   Page No.___

   a. Cam lever(s) _____

   b. Side levers _____

   c. Russel lever(s) _____

   d. Button(s) _____

   e. Other (List anything else you must remember to set or release.)

   _____

   _____

   _____

5. Pull out to holding position (H.P.) the number of needles you want to use and move the cam back and forth without yarn to line up the needles in working position (W.P.).

Some machines have cast-on combs, others cast-on wires, and yet others only a ravel cord. Follow your own manual to start your knitting with open cast-on method. Here are some of the methods most commonly used:

Open Cast-on with Cast-on Comb: Bring 40 needles into "B" position. Hang the cast-on comb as shown in your manual (Page No. ___), and move the carriage across with yarn fed through the yarn feeder. You have knitted 1 row. Now pull down the cast-on comb and let the teeth of the cast-on comb hang on the loops of the yarn between the needles. Place claw weights on the cast-on comb. If the cast-on comb came with your machine, all of these are shown step by step in your manual. Knit 20 more rows, and remove the work from the machine by moving the cam across without yarn fed through the yarn feeder.

Refer to your manual, Page No. _____

Open Cast-on with Cast-on Wire: Bring 40 needles into "B" position. Thread the yarn feeder with scrap yarn. Knit 1 row. Place the cast-on wire between the needles and the sinker posts across those stitches just knitted. Press down the cast-on wire so that it will be lower than the needles. Pull out one or two needles at both ends of the work and one or two in the center to keep the cast-on wire in place.

Knit 5 or 6 more rows and remove the wire. Hang claw weights at both ends and at the center. Knit 20 rows and remove the work from the machine by moving the cam across without yarn.

Refer to your manual, Page No. _____

Open Cast-on with Ravel Cord: This is a very good and simple way to cast on a small number of stitches on any machine, for a band or pockets, or anything that requires only a small number of stitches. Bring out 20 needles into "B" position. Thread the yarn feeder with waste yarn. Knit 1 row by moving the cam across. Place a piece of ravel cord between the needles and the sinker posts as in the case of casting on with cast-on wire.

Pull down firmly with one hand both ends of the ravel cord and the loose end of your waste yarn that is hanging down from one end of the work. Knit 4 or 5 rows. Pull out the ravel cord and hang claw weights. Knit 20 rows and remove the work from the machine by moving the cam across without yarn.

Refer to your manual, Page No. _____

B. Permanent Cast-On Methods: There is more than one way to cast on with a closed edge (or permanent edge) which will not rip out from the beginning row and could be used as a finished edge of a garment. If you plan to wash and dry your swatch to determine the shrinkage, you must have one of the permanent cast-on edges and a bound edge to prevent unraveling.

SAMPLE NO. 1 -- Permanent Cast-on with "e"

1. Bring out 40 needles in the center of the machine to W.P.

2. Cast on with any of the open cast-on methods. Knit 8 to 10 rows.

3. Change to ravel cord and knit 1 row only.

4. Turn the row counter (R.C.) to 000, and set the cam at right (R).

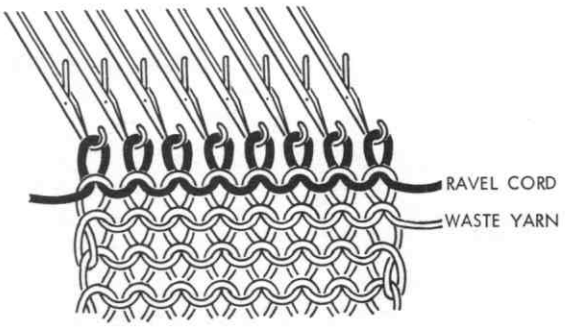
5. Pull out all 40 needles to holding position (H.P.).

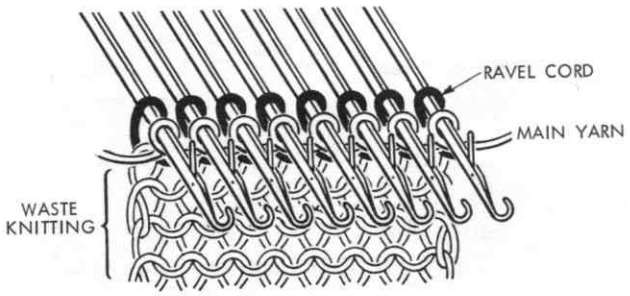
6. Start from the left side. Wrap each needle with yarn as if you were writing a letter "e", with the left thumb holding under the needle the last "e" you just made. Keep making an "e" around the needles and move toward your right. Do not make these "e's" too tight.

7. When you have finished wrapping all 40 needles, feed the yarn into the yarn feeder of the cam.

8. Move the cam gently and slowly across the needle bed to the left. You have knitted 1 row. Cam ends at left (L).

9. Knit back to R. The row counter indicates 002. Knit even until the row counter reads 040.





10. Change to scrap yarn and knit 8 to 10 rows. Remove the work from the machine by moving the cam across without yarn.

11. Stretch the work lengthwise immediately after removing from the machine.

12. Pull out the ravel cord (this separates the waste knitting from the main part).

NOTE: Steps 1 through 3 -- optional. You may start a swatch or any piece of work with Step 4. However, you will find it much easier to work on the machine when you have several rows of waste knitting before making "e's".

SAMPLE NO. 2 -- Permanent Cast-on with Chain Stitches

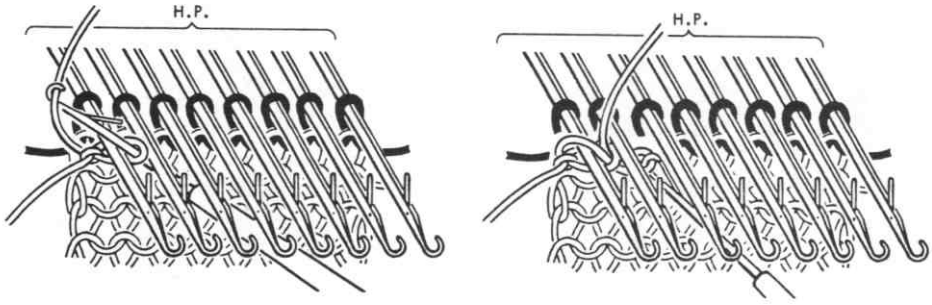
1. Cast on 40 sts. and knit 9 rows with scrap yarn.

2. Change to ravel cord and knit 1 row only. End the cam at R.

3. Turn the row counter (R.C.) to 000.

4. Pull out all 40 needles to H.P.

5. Make a loop with main color and put it on the latch tool. Place the latch tool between the first and the second needles from the left edge. Make a chain over the needle and pull down the latch tool.



6. Move the latch tool one space toward the right, push it up between the needles. Make a chain and pull it down.

7. Continue in the same manner until chains are made on all 40 needles.

8. Hook the loop on the latch tool on the last needle. (The last needle has one chain and a loop on.)

9. Set the cam lever to knit all the stitches regardless of needle position

   Cam lever setting: _____

10. Move the cam slowly across. (Row 1)

11. Knit even until the row counter reads 040 and remove the work from the machine using waste yarn.

12. Stretch the piece lengthwise and pull out the ravel cord. (Now the waste knitting in Step 1 is separated.)

13. Make another sample making the chains from right to left by reversing the L-R directions in Step 5 through 10.

SAMPLE NO. 3 -- Starting a Garment with Open Cast-on

When you start a garment, it is best to start with waste knitting. Open cast-on is the easiest and the quickest way to start knitting a piece.

1. Cast on 40 sts. with any method and knit 8 to 10 rows with scrap yarn.

2. Knit 1 row only with ravel cord. End the cam at R.

3. Turn the row counter to 000.

4. Change to garment yarn (or main color). This is the beginning of the actual garment knitting.

5. Knit 40 rows. (The R.C. reads 040.)

6. Change to scrap yarn and knit 8 to 10 rows.

7. Remove the work from the machine by moving the cam across without yarn.

8. Stretch the work lengthwise. DO NOT pull out the ravel cord.

9. Block all the samples and place a sticker with sample number on each sample.

CHAPTER 4 BINDING OFF

There are different ways to bind off, either while the work is hanging on the machine or after it has been removed. It is a good idea to become well acquainted with the different methods so you will be able to use any of them as the need arises. Whatever method you use, DO NOT BIND OFF TOO TIGHT, unless you want it to be tight.

SAMPLE NO. 4 -- Binding Off with a Transfer Tool

1. Cast on 40 sts. with any method and knit 40 rows. End the cam at R.

2. Bind off as follows:

   a. Pull forward the 2 needles nearest the cam (at R) until the stitches go behind the latches. Remove the yarn from the yarn feeder.

   b. Hand knit these 2 sts. with the yarn attached to the work.

      To hand knit, lay the yarn from right to left across the hook of the needle and gently push back the needle with your thumb on the needle butt until the latch closes over the hook and the stitch behind the latch slides off the needle. Repeat this procedure with the next needle.

   c. With a transfer tool, transfer the stitch on the 2nd needle from the edge to the 1st needle. Pull this needle forward until the 1st stitch goes behind the latch and the stitch which was transferred from the 2nd needle is in front of the latch.

   d. Hand knit and end up with 1 stitch on the needle. Transfer this stitch to the now vacant 2nd needle.

   e. Take the yarn and hand knit the stitch on the next needle to your left in the same manner.

   f. Transfer this stitch to the next needle to your right. Place it on the hook, in front of the latch, as you did in Step c above.

   g. Hand knit this stitch as in Step d above and end up with 1 stitch. Transfer this stitch back to the next needle to your left which is now vacant, as you did in Step e.

   h. Repeat the procedure in Steps e through g as many times as necessary until all 40 sts. are bound off. Cut the yarn and slip through the last stitch.

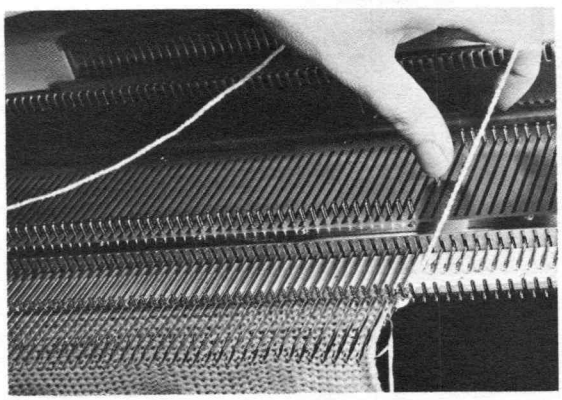
SAMPLE NO 5 -- Binding Off with Latch Tool

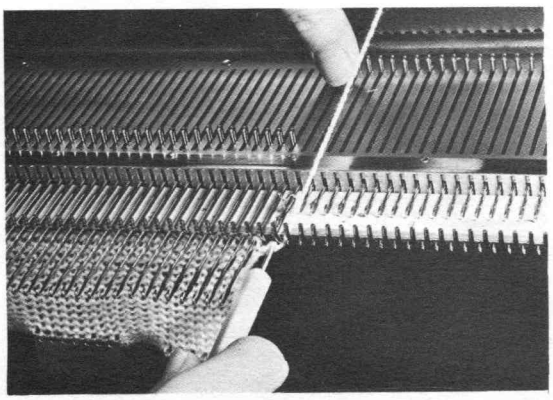
1. Cast on 40 sts. with any method and knit 40 rows. End the cam at R.

2. Bind off with latch tool as follows:

   a. Pull out all the needles to H.P. All the stitches will be behind the latches.

   b. Hook the latch tool onto the hook of the 1st needle at the right. Push this needle back with the left thumb on the needle butt until the stitch on the needle slips onto the latch tool.

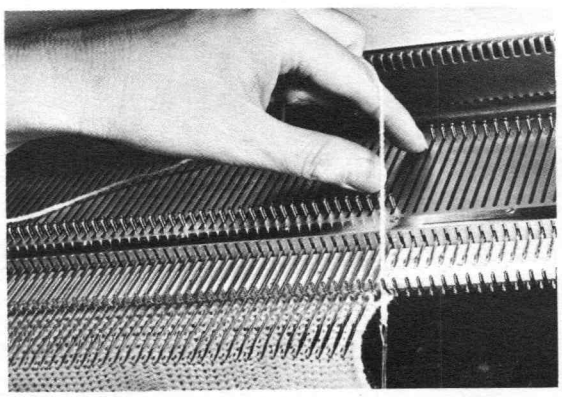


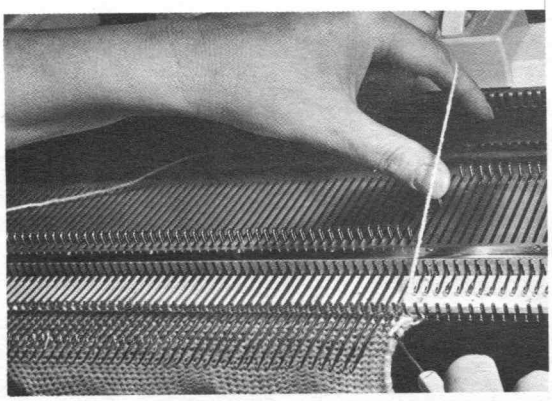


   c. When the stitch moves to the latch tool, slip the yarn (which is removed from the yarn feeder of the cam) around the sinker post to the right of the latch tool. Make a chain with the latch tool.

   d. As you make this chain, pull down the latch tool between the two sinker posts.

   e. Slip this chain behind the latch of the latch tool.

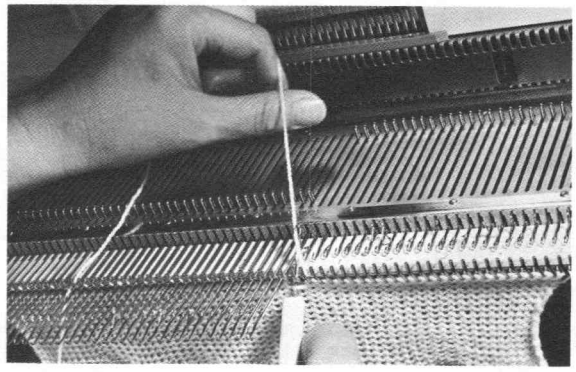




f. Place the latch tool on the hook of the next needle to your left as you push this needle back toward the non-working position (N.W.P.).

g. When the stitch on the needle moves onto the latch tool, let it slip behind the latch of the latch tool. Now you have 2 stitches on your latch tool.

h. Make a chain with the yarn connected to the stitch, making sure the yarn goes between the two sinker posts as in Step e above.



By going between the sinker posts every time, each chain will be looped around a post. This will insure your chains are a uniform size and prevent the bound edge from getting too tight.

i. Repeat Steps g through h above as many times as necessary to bind off all 40 sts. Cut the yarn and slip through the last stitch.

3. Stretch the work lengthwise immediately after removing from the machine.

4. Make another sample by binding off from left to right.

SAMPLE NO. 6 -- B.O. with a Tapestry Needle--L to R

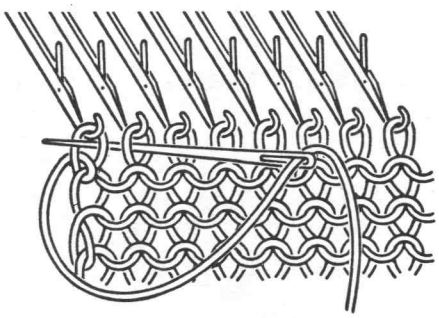
1. Cast on 40 sts. with any method and knit 41 rows. End the cam at L.

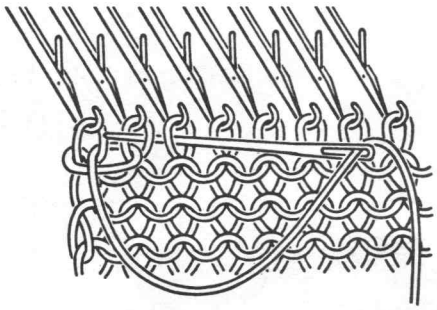
2. Remove the yarn from the yarn feeder of the cam.

3. Cut the yarn with an end approximately 3 widths of the work to be bound off.

4. Thread this yarn through the eye of the tapestry needle.

5. Pull out all 40 needles to H.P. but leave the stitches in front of the latches.



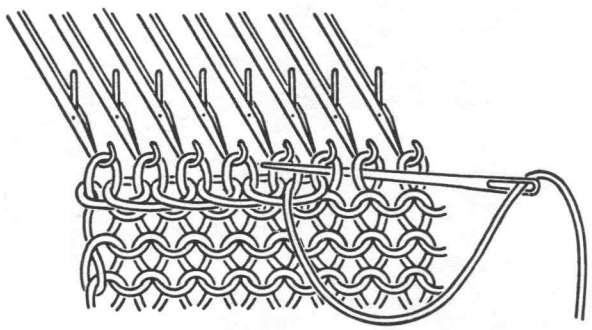


6. Insert the tapestry needle into the 1st stitch on the left side from the front (which is the purl side of the piece). Pull the yarn through to the left, but not too tight.

7. Insert the tapestry needle through the next stitch to your right, going from the front (purl side) and coming out of the 1st stitch from the back to the front as if doing a back stitch in hand sewing. Pull the yarn lightly so that it is not too loose, loopy, or tight between the stitches.

8. Repeat Step 7 as many times as necessary by going into the front of the next stitch to your right and coming out of the back of the previous stitch.

9. Remove from the machine when the tapestry needle has gone through all the stitches twice, once from the front to the back, and once from the back to the front.



SAMPLE NO. 7 -- B.O. with a Tapestry Needle--R to L

1. Cast on 40 sts. with any method and knit 40 rows. End the cam at R.

2. Remove the yarn from the yarn feeder of the cam.

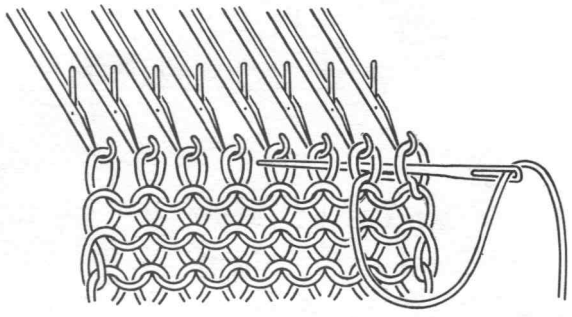
3. Cut the yarn with an end approximately 3 widths of the work.

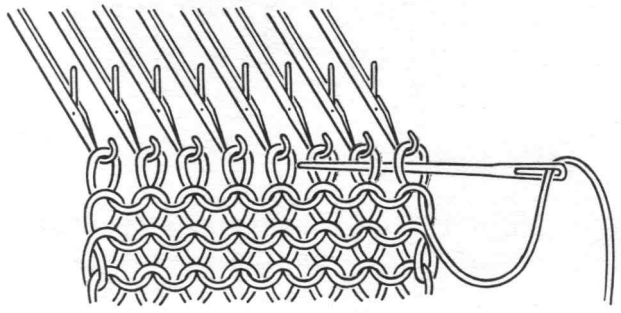
4. Thread this yarn through the eye of the tapestry needle.

5. Pull out the needles to H.P. with the stitches still held in front of the latches.

6. Insert the tapestry needle into the 1st stitch on the right edge from the back to the front. Pull it out.

7. Insert the needle around the 1st stitch and into the 2nd stitch from the right edge, again from the back to the front.

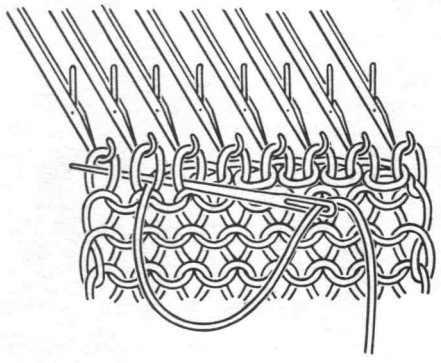




8. Insert the needle into the 1st stitch (from the front to the back) and out of the 3rd stitch (from the back to the front) skipping the 2nd. This is the same procedure as the back stitch.

9. Insert the needle into the 2nd, from the front to the back and out from the 4th, skipping the 3rd.

10. Repeat the above procedure until all the stitches are bound off.



SAMPLE NO. 8 -- B.O. with Slip Crochet Stitches

1. Make another piece of 40 sts. and 40 rows as in Sample No. 3 and remove from machine.

2. Hold the sample piece with knit side facing you. The waste knitting with ravel cord is at the bottom and the waste knitting without ravel cord is at the top.

3. Fold the top waste knitting toward you, showing the row (or ridge) where the yarn changed to waste yarn at the very top as the fold line.

4. Using a third color yarn, slip crochet stitch, going through each and every one of the stitches of the last row of the main color. DO NOT pick up the stitches of the waste knitting.

5. You should end up with 40 sts. with the third color. Rip out the waste yarn.

NOTE: Using the 3rd color distinguishes the slip crochet from the main part.

SAMPLE NO. 9A -- B.O. with Single Crochet--2 Different Methods

1. Hold the same piece used in Sample No. 8 upside down with the knit side facing you.

2. Fold the waste knitting part toward you showing the 1 row of ravel cord and the very 1st row of the main color as the fold line.

3. Using the 3rd color, insert the crochet hook into the very 1st stitch of the main color. Make 2 chains and 1 single crochet into the next stitch. DO NOT PICK UP or GO INTO ravel cord stitches.

4. Going into one stitch at a time, pull yarn (3rd color) through the next 2 stitches (makes 1 single crochet).

5. a. Make a single crochet in 1st loop.

   b. Make a single crochet in 2nd loop.

   c. Make a single crochet pulling yarn through 3rd and 4th loop (2 together) as explained in Step 4.

6. Repeat Step 5 as many times as necessary ending with a loop on the crochet hook.

7. Cut the yarn and slip through the latch tool.

8. Pull out the ravel cord. Waste yarn will separate from the work.

SAMPLE NO. 9B -- B.O. with Single Crochet

Use another one of the cast-on samples with scrap knitting at the top.

1. Hold the piece right side up with knit side facing you. Fold it over at the line where the color changes to waste knitting.

2. Using the 3rd color, slip the crochet hook through the very 1st stitch of the main color yarn at right, chain 2, single crochet into the next stitch.

3. Double up the next 2 sts. by inserting the crochet hook into the next 2 sts., pull yarn and make 1 single crochet.

4. Go into the next stitch and make 1 single crochet.

5. Repeat Step 4 above once more. This will make 1 single crochet twice.

6. Repeat Step 3 above. This will make 1 single crochet out of 2 sts.

7. Repeat Steps 4 through 6 as many times as necessary.

8. Cut the yarn. Slip through the loop of the last single crochet stitch.

9. Block the piece and place the sample number near this edge.

SAMPLE NO. 10 -- Latch Tool B.O. with Knit Side Facing You

1. Hold the work with knit side facing you. Use one of the cast-on samples.

2. Fold the waste knitting part toward you to show the ridge (or row) where the color changed from the main color to waste yarn as the folding line.

3. Pick up and hang back on the needles all the stitches of the very last row of the main color. Rip out the waste yarn knitting after hanging all the stitches.

4. Follow the same procedure as in Sample No. 5 -- Binding off with Latch Tool.

5. Place a sticker or a tag with sample number near this edge.

Now compare the results of the different methods. You will notice some of the samples look the same as another, even though you may have used different methods.

Lessons to be learned from these samples are:

a. There are different ways to get the same result. If the end result is the same, it does not matter which method you use. Use the easiest, the quickest or the most convenient method to get the job done, based on the circumstances and your preference.

b. The same B.O. methods can be used for an edge with open cast-on and for an edge removed on waste yarn.

c. You may use the same yarn or contrast yarn to bind off. If you use a good contrast color, it could become part of a design.

CHAPTER 5 SHORT ROWS AND PARTIAL KNITTING

Short rows (or partial knitting) knits only a part of a row instead of the entire row. This technique is used to create shapes and special effects, such as shoulder slopes, bust darts and certain curves. It is also used in shaping the heel and toe of a sock, mitring corners, and circular knitting. There are endless applications of this technique once you learn the mechanism of your own knitting machine. It is one of the key areas which you must master in order to really learn the art of machine knitting.

Follow the instructions and learn from your own experimenting. Again you will be making samples. Don't forget to place a sticker or a tag with an identifying number on each sample you make.

As you follow the procedure, step by step, write in the blank spaces provided the information which pertains to your machine. If you are not sure of the process when you come to a blank space in the instruction, refer to your manual. When you get the results you want, be sure to write down the information in the blank space provided and make note of any other points you feel is necessary.

SAMPLE NO. 11 -- Experimental Knitting

1. Cast on 40 sts. with "e" cast on. Knit 20 rows and end the cam at R.

2. Pull out 6 sts. on the left side (opposite the cam) to H.P.

3. Cam lever is set for plain (stockinet) stitch as you have been knitting other samples. Note the setting of the cam lever(s). At this point you have not changed anything.

_____ _____

_____ _____

4. Knit across 1 row. Cam ends at L. Write down what happened to those 6 sts. held in H.P.

_____

5. Pull out 10 sts. at left (cam side) to H.P. and put the next 10 sts. to middle position (M.P.). Knit across 1 row with the same cam lever setting. Cam at R. Write down what happened to those 20 sts.

_____

In this experiment, you went through the motions of putting a number of stitches in holding position but it did not mean anything because your cam lever was set for knitting stitches in any position except "A" position.

Now let's try something else.

6. Set your cam lever(s) (or Russel Levers) to holding so you can knit only those stitches left in W.P. and not those in H.P.

Manual Page No. _____

Cam lever setting:_____

7. Pull out 10 sts. on the left side (opposite side from the cam) into H.P. and the next 6 sts. into the middle position. Knit across 1 row. Cam at L.

Now you have a different result. You could have done one of the following:

a. It did not knit the 10 sts. in H.P. but did knit the rest.

b. It did not knit any of the stitches on the needles in H.P. or M.P., and knitted only the stitches on the needles in "B" position.

Whatever the result may be, be sure to note the result from this experiment. Circle a or b above. Don't be confused by the names or labels of the cam lever(s). What is important is that you learn how your cam levers work.

8. Knit across 1 row. Cam at R.

9. Set the cam lever back to knitting any position. _____

10. Knit 2 rows and end the cam at R.

11. Set the cam lever to holding._____

12. Pull out 5 needles to H.P. at right (cam side) and knit 1 row.

Write down what happened in this experiment. Probably one of the following will be the result:

a. The yarn skipped over the 5 needles in H.P. and knitted the rest of the work beginning with the 6th needle from the right edge.

b. Dropped all the stitches except 5 sts. in H.P.

c. Dropped some stitches next to the 5 sts. in H.P.

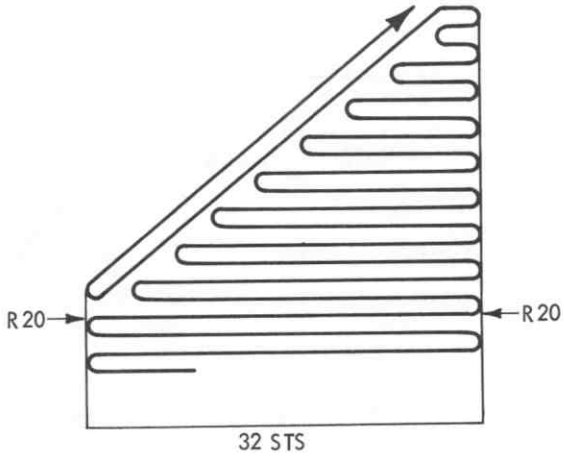
13. Make a note of the result you obtained from this experiment and remove the work from the machine.

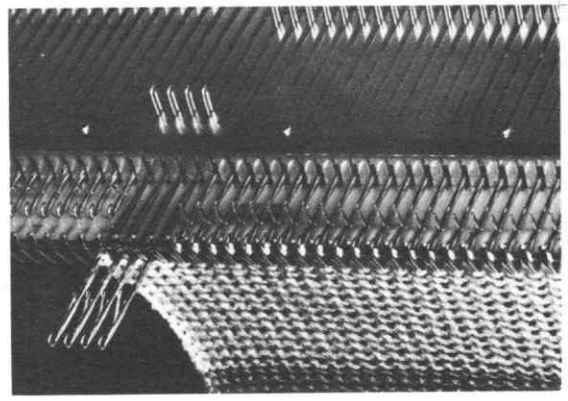
SAMPLE NO. 11A -- Decreasing Short Rows with Manual Wrapping

1. Cast on 32 sts. with any method and knit 20 rows. Cam at R.

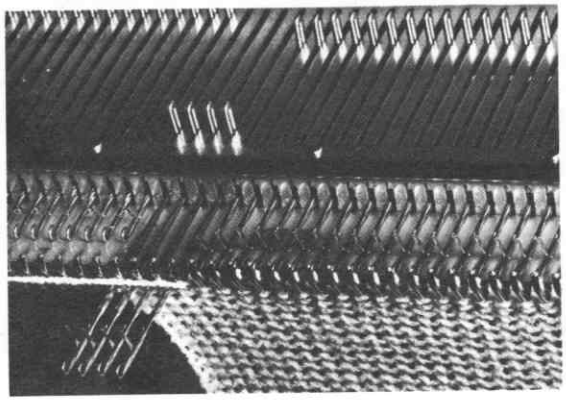
2. Set the cam lever to holding:_____

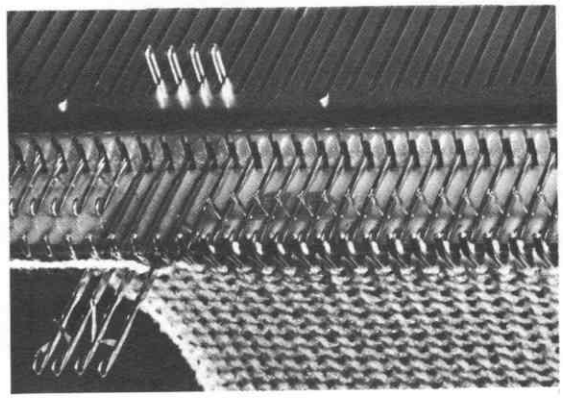
3. Counting from the left side of the work, pull out 4 sts. to H.P. and knit 1 row.





4. Take the yarn attached to the last stitch knitted and place it under the 1st holding needle (which is next to the last stitch knitted) and over the rest of the holding needles. This is called manual wrapping.





5. Knit 1 row. Cam at R.

6. Pull out to H.P. 4 more needles and knit 1 row. Wrap the yarn around the holding needle which is next to the last stitch knitted. Knit 1 row. Cam at R.

7. Repeat Step 6 until 4 sts. remain in working position.

8. Set the cam to knit all the stitches in any position._____
Knit 2 rows over all the stitches and bind off.

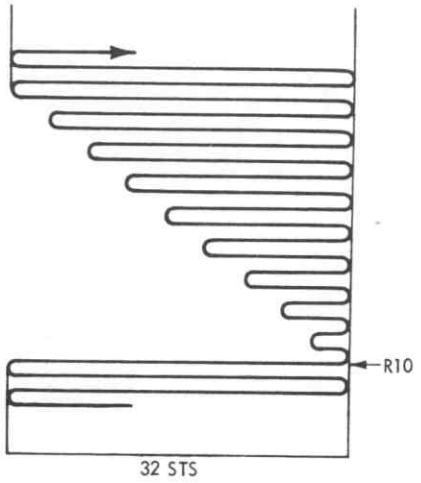
9. Make another sample by reversing L-R directions.

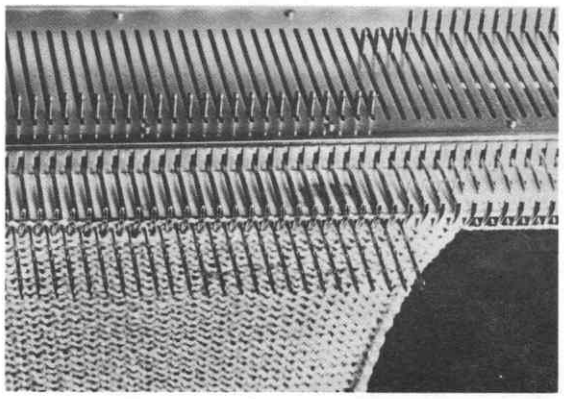
SAMPLE NO. 11B -- Increasing Short Rows with Manual Wrapping

1. Cast on 32 sts. with any method and knit 10 rows. Cam at R.

2. Set the cam to knit stitches in "B" and the middle positions, but not the stitches in H.P.

Cam lever setting:_____





3. Counting from the left side (opposite the cam), pull out 28 sts. to H.P., leaving only 4 sts. (on the cam side) in work.

4. Knit across 1 row. Cam at L.

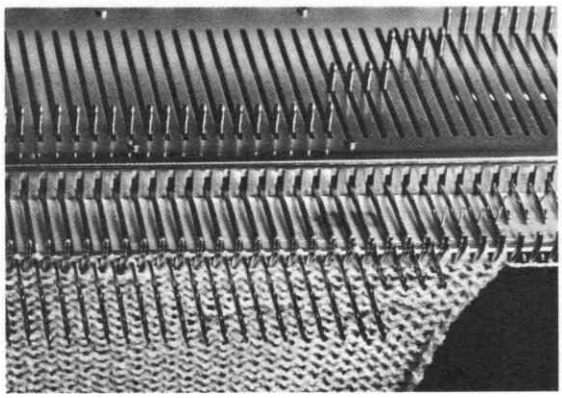
5. As in the case of decreasing short rows, wrap the yarn around the 1st holding needle next to the last stitch knitted.

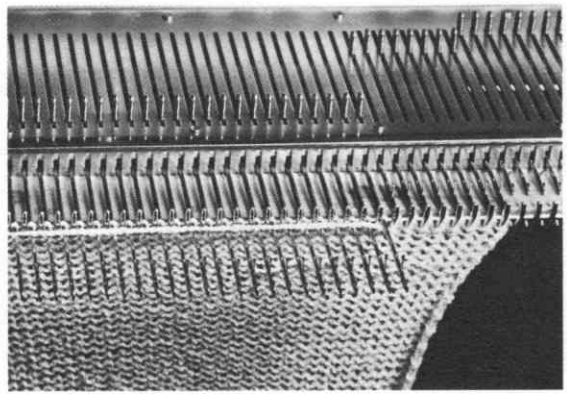
6. Knit 1 row. Cam at R.

7. Push into M.P. the 4 needles nearest to the working needles, and knit 1 row.

8. Manually wrap the yarn around the needle next to the last stitch knitted as you did in Step 5 above and knit 1 row.

9. Repeat Steps 7 and 8 until there are 4 sts. remaining in H.P.





10. Change the cam lever setting to knit stitches in any position and knit 20 rows. Bind off.

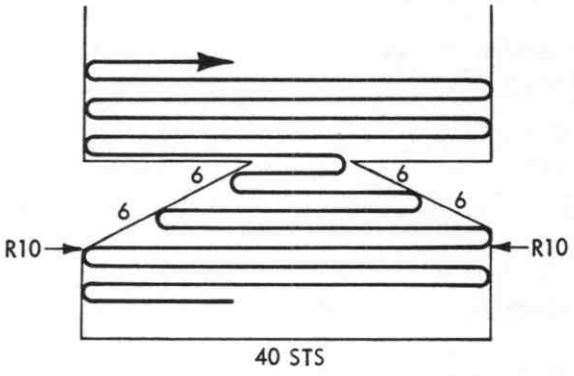
11. Make another sample by reversing the L-R directions.

SAMPLE NO. 11C -- Decreasing Short Rows with Automatic Wrapping

In this procedure, the working needles decrease as you knit.

1. Cast on 40 sts. with any method and knit 20 rows. Cam at R.

2. Set the cam lever to holding:_____



3. Pull out 5 needles from the left edge of the work (opposite the cam) to H.P. and knit 1 row.

4. Pull out to H.P. the very last stitch you just finished knitting. This last stitch pulled out to H.P. will prevent a hole and a staircase effect.

5. Before knitting back to right, pull out 5 needles from the right edge of the work to H.P. Knit 1 row.

6. Pull out the very last stitch knitted to H.P. as you did for the other side.

7. Pull out the next 5 needles at left to H.P. and knit 1 row. Cam at L.

8. Pull out the last stitch knitted to H.P., and pull out 5 more needles at the opposite end of the work to H.P.

9. Knit back to the right. Pull out the last needle knitted to H.P. to complete the 2nd set of short rows.

You have completed 2 sets of short rows with 6 sts. each on both sides of your work. Now you want to put those holding needles back into work. Since you started to hold needles on the left side, you must start putting them back into work on the left side. Remember the result of the experiment in previous sample.

10. Push all the needles held in H.P. on the left side (opposite the cam) to M.P.

11. Set the cam lever to knit stitches in "B" and the middle positions but not in H.P.

    Cam lever setting:_____

    NOTE: If you circled "a" as the result of your experiment in Step 7 of Sample No. 11, do not change the cam lever.

12. Knit across 1 row. Cam at L.

13. Set the cam lever to knit all the stitches regardless of needle position, except "A" position. Knit 1 row.

    Cam lever setting:_____

The reasons for these two different methods to put holding needles into working position are:

a. There are no more holding needles on the cam side after Step 10.

b. There are no more needles required to remain in H.P. on the next row.

c. It is quicker and easier to change the cam lever and knit across than to push all the holding needles into M.P. and line them up in the right position as you did in Step 10 above.

14. Repeat Steps 2 through 13 above a couple more times to get acquainted with this procedure.

15. Make another sample by reversing the L-R directions by ending the cam at L and pulling out the needles from the right side of the work first.

SAMPLE NO. 11D -- Increasing Short Rows with Automatic Wrapping

1. Cast on 40 sts. with any method and knit 10 rows. Cam at R.

2. Set the cam to knit stitches in "B" and the middle posisions only and not the stitches in H.P.

   Cam lever setting:_____

3. Counting from the left side (opposite the cam) pull out to H.P. all the needles except 6 sts. nearest the cam which remain in W.P.

4. Knit across (cam at L now) and pull out to H.P. the very last stitch knitted. This will leave 5 sts. in working.

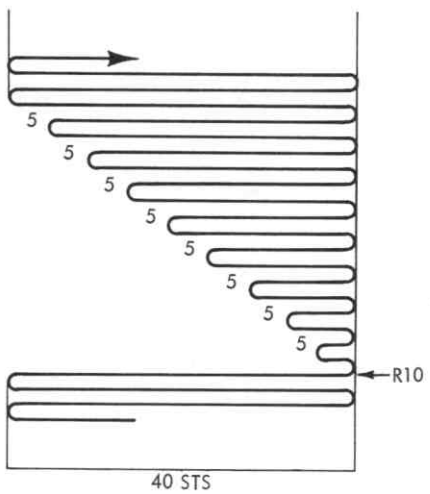
5. Knit back. Cam at R.

6. Push into the middle position the 6 needles nearest the 5 sts. already in W.P., and knit 1 row. Cam at L.

7. Pull out to H.P. the very last stitch knitted. This makes 10 sts. in working. By pulling the last needle knitted to H.P. you are wrapping the yarn around this needle on the next row to prevent a staircase effect.

8. Repeat the procedure described above until 5 sts. remain in holding.

9. Instead of pushing the last 5 needles into M.P., change the cam lever to knit all the stitches regardless of the needle position. Knit across.



   Cam lever setting:_____

10. Remove the work on waste yarn.

11. Make another sample by reversing the L-R directions.

SAMPLE NO. 11-E -- Decreasing and Increasing Short Rows with Manual Wrapping

1. Cast on 40 sts. with any method and knit 20 rows. Cam at R.

2. Decreasing Short Rows:

   a. Set the cam lever to do short rows: _____

   b. Counting from the left side of the work, pull out 5 sts. into H.P. and knit 1 row.

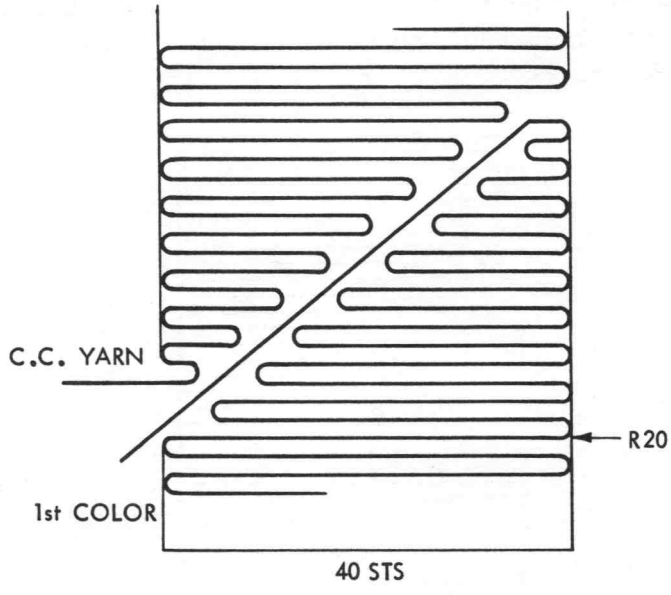
   c. Wrap the yarn around the 1st holding needle next to the last stitch knitted to prevent the staircase effect. Knit 1 row and end the cam at R.

   d. Pull out the next 5 sts. into H.P. and knit 1 row.

   e. Wrap the yarn around the 1st holding needle next to the last stitch knitted and knit back.

   f. Repeat Steps d and e until 5 sts. remain in working. Cam at R.

3. Change the cam lever to knit all stitches regardless of the needle position. Knit 1 row and end the cam at L.



4. Increasing Short Rows:

   a. Change the cam lever to knit stitches in "B" and the middle positions but not the stitches held in H.P.

      Cam lever setting:_____

   b. Pull out to H.P. all the needles except 5 sts. nearest the cam (left). Change the yarn to a contrasting color.

   c. Knit 1 row (cam at R) and wrap the yarn around the 1st holding needle next to the last stitch knitted.

   d. Knit back to left.

   e. Push into M.P. 5 holding needles nearest the working needles and knit 1 row.

   f. Wrap the yarn around the 1st holding needle next to the last stitch knitted and knit 1 row. Cam is back at L.

   g. Repeat Steps e and f above until 5 sts. remain in H.P. on the right side of the work. Cam at L.

5. Change the cam lever to knit stitches in any position and knit 2 rows. End of the increasing short rows.

6. Knit several more rows and bind off.

7. Make another sample by reversing the L-R directions.

SAMPLE NO. 11F -- Decreasing and Increasing Short Rows with Automatic Wrapping

1. Cast on 40 sts. with any method and knit 20 rows. Cam at R.

2. Decreasing Short Rows: Set the cam lever for holding:_____

   a. Counting from the left side of the work, pull out 4 sts. into H.P. Knit 1 row.

   b. Pull out to H.P. the last stitch knitted to prevent the staircase effect and knit back. Cam at R.

   c. Pull out to H.P. 4 more stitches and knit across to L.

   d. Pull out 1 more stitch to complete this set of 5 sts.

   e. Repeat Steps c and d above until 5 sts. remain in W.P. End the cam at R.

3. Change the cam lever to knit all stitches regardless of the needle position. Knit across 1 row and end the cam at L.

4. Increasing Short Rows:

   a. Change the cam lever to knit the stitches on the needles in "B" and the middle positions, but not the stitches on the needles in H.P.

      Cam lever setting:_____

   b. Pull out to H.P. all the needles except 6 sts. nearest the cam (left).

   c. Remove the yarn from the yarn feeder and feed a contrasting color yarn. Knit 1 row and end the cam at right.

   d. Pull out the last stitch knitted to H.P. (This leaves 5 sts. in W.P.)

   e. Knit back 1 row.

   f. Push into the middle position 6 needles next to the working needles and knit 1 row.

   g. Repeat Steps e and f above until 5 sts. remain in H.P. on the right side. Cam at L.

5. Change the cam lever to knit all the stitches regardless of the needle position and knit 4 rows. Bind off.

6. Make another sample by reversing the L-R directions.

When you are shaping certain curves, you may be required to decrease or increase more than 1 stitch every row. In such a case, knitting in short row every row, holding the required number of stitches every row, seems to be the best solution.

The main differences between short row every other row and every row are:

1. In knitting short row every row, the needles may be moved into or out of H.P. regardless of the cam position.

2. Automatic wrapping method does not work. You must wrap the yarn manually.

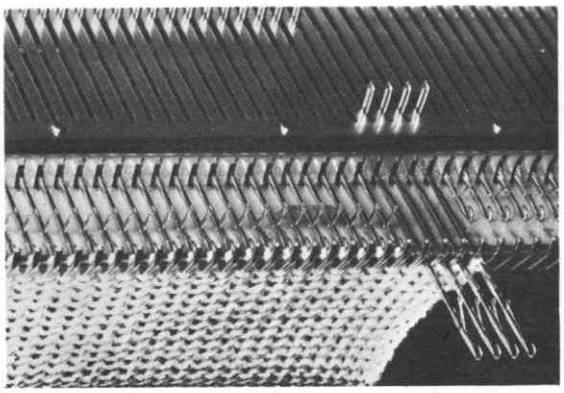
SAMPLE NO. 11G -- Decreasing and Increasing Short Row Every Row

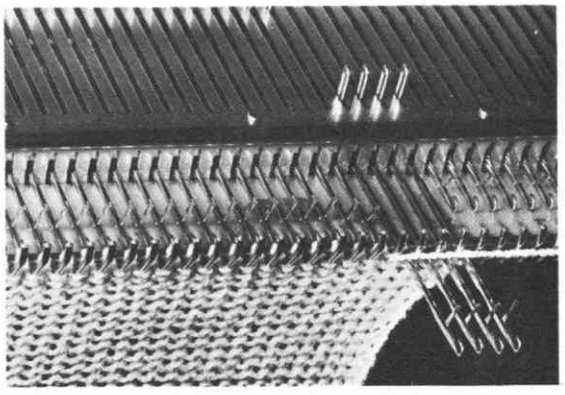
1. Cast on 40 sts. with any method and knit 21 rows. Cam at L.

2. Decreasing Short Rows:

   Set the cam lever for short row knitting:_____

3. Pull out to H.P. 4 needles from the right edge of the work and knit 1 row. Cam at R.





4. Wrap the yarn around the holding needle next to the last stitch knitted by placing the yarn under this holding needle.

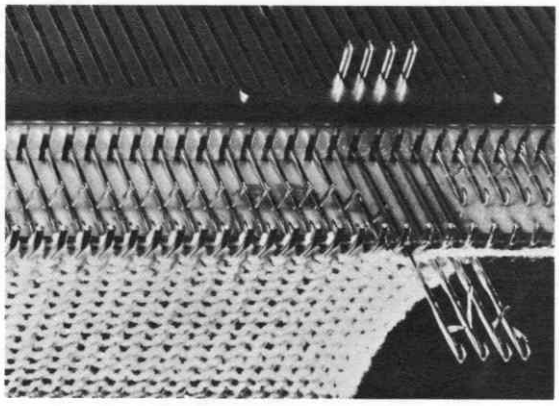
5. Before knitting back to the other direction, pull out to H.P. the next 4 needles on the right side.

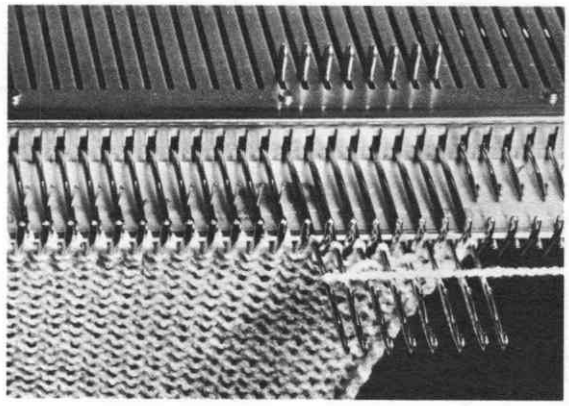
6. Bring the yarn over to the working needles by placing the yarn under the 1st of the 4 needles pulled out, over the 2nd and under the 3rd and 4th needles. Knit back to L.

7. Pull out 4 more needles on the right side and knit to R.

8. Wrap the yarn around the holding needle next to the last stitch knitted.

9. Pull out the next 4 needles to H.P. and weave the yarn under and over those holding needles in the same manner as Step 6. Knit back to L.





10. Repeat Steps 7 through 9 until all the needles are held in H.P.

11. Change the cam lever to knit any position and knit across. Cam at R.

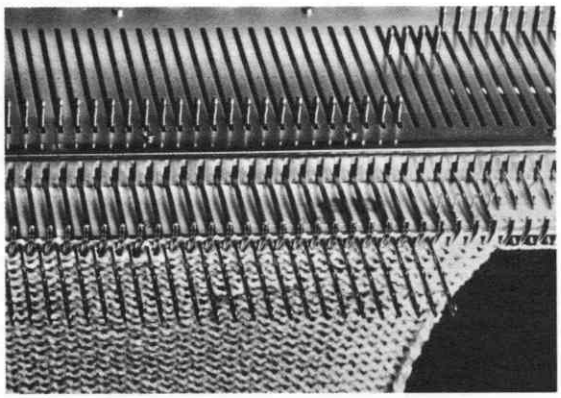
12. Change the yarn to a contrasting color.

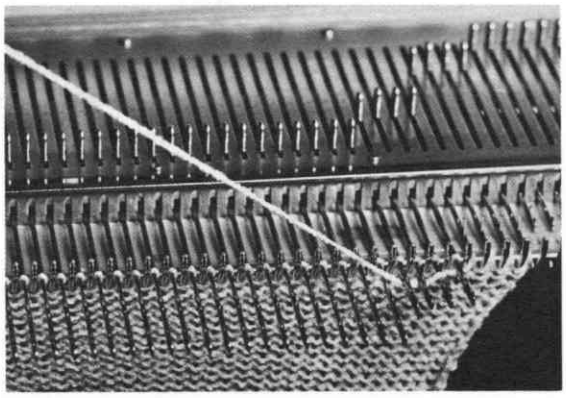
13. Increasing Short Rows:

    Set the cam lever to knit stitches in "B" and the middle positions but not those held in H.P.:

14. Pull out to H.P. all the needles except 4 needles right next to the cam on the right side of the work. Knit across to L.

15. Push the next 4 needles on the right side into M.P. and bring the yarn over to the holding needles by placing it under the 1st needle in M.P., over the 2nd and under the 3rd and 4th needles. Knit back to R.





16. Push the next 4 needles into M.P. and knit to L.

17. Repeat Steps 15 and 16 above until all the needles are in working position.

18. Change yarn to the 1st color and knit 10 rows and bind off or remove on waste yarn.

NOTE: Rule of thumb for wrapping and weaving yarn across the holding needles in short rows every row:

Decreasing:

1. First wrap the yarn around the holding needle next to the last stitch knitted by placing the yarn under it.

2. Then pull out to H.P. the next needle or group of needles to be held.

   a. When you decrease 1 stitch, pull out 1 needle to H.P. and take the yarn and place it under this needle.

   b. When you decrease 2 sts., pull out the next 2 needles to H.P. and place the yarn under those 2 needles.

   c. When you decrease 3 sts., pull out 3 needles to H.P. and place the yarn under the 1st, over the 2nd and under the 3rd needle.

   d. When you pull out 4 needles, place the yarn under the 1st, over the 2nd and under the 3rd and 4th needle; or place the yarn under the 1st 2 needles, over the 3rd and under the 4th needle.

   e. When you pull out 5 needles, place the yarn under the 1st 2 needles, over the 3rd and under the 4th and 5th needle.

f. When there are more than 5 needles to pull out, place the yarn over every 2nd or 3rd needle, ending with under 1 or 2 needles.

g. Always end with yarn under the last 1 or 2 needles. Never go over more than 1 stitch at a time.

Increasing:

Push into M.P. the next group of needles and weave at the same rate as above (Steps a through g).

CHAPTER 6 SLIP, SLIDE AND FREE PASS

To pass the cam across the needle bed without knitting or dropping stitches requires the proper cam setting. The device to do this is located on the carriage. Some machines have buttons to push in or pull out, others have a knob or knobs to turn to "slip" position, and others have a lever to set to "slip" or "S" position.

There also may be two separate buttons or levers to control the movements of the cam to the left only and right only, or a single control for the movements of the cam to both directions. At any rate, the main jobs of these devices are:

1. Slip the cam across to the other direction without dropping stitches, and without knitting any stitches, regardless of the needle positions.

2. Knit only the stitches on the needles held out to H.P. and not to knit the stitches on the needles in "B" position. This is the reverse of the short rows.

3. Create pattern work with slip stitches by combining the cam lever setting, the needle positions, and the number of stitches and rows.

However, at this stage of learning, let's concentrate on the first two, to slip the cam across to the other side without dropping or knitting any stitches.

Go to your manual and fill in the blank spaces:

1. What is the name of this device on your particular machine?_____

2. Where is it located? Check one.

   a. In front of the handle on the cam. _____

   b. Behind the handle of the cam. _____

   c. Right under the handle, in the center of the cam. _____

3. Do you have one or two controls, meaning button(s), knob(s), or lever(s)?

   _____

4. How do you release them when you want to go back to normal knitting? Check one.

   a. By returning the lever to knitting or some other position._____

      What is the name of this position? _____

   b. By pushing some other button(s)._____

      What is the name of this button or buttons? _____

   c. By pushing or pulling the same button(s) into another position. ___

      What is the name of this position? _____

   Refer to your manual and find out what procedure to follow when you want to:

1. Slip the cam across (make a free pass) to the other side when all the stitches are in "B" position. _____

2. Get back to knitting. _____

3. Slip the cam across to the other side when some of the needles are in H.P. and you do not want to knit or drop any stitches.

   _____

4. Get back to knitting. _____

5. Knit only the stitches in H.P., but not to knit the stitches in "B" position. This operation is the reverse of knitting short rows (or partial knitting).

   _____

6. Get back to knitting all the stitches. _____

7. Slip the cam across to the other side without knitting or dropping stitches when all the needles are held in H.P.

   _____

Mastering the art of machine knitting will depend on your understanding of the mechanism called "slip, slide, or free pass". When you are no longer confused with "short rows - or partial knitting" and "slip, slide and free pass" in any given situation, plain stockinet or in pattern stitches, you have mastered your own knitting machine. When you reach that point, you will be in control of the machine; it will no longer control you.

Let's get acquainted with the procedures of slip, slide or free pass. Again, you are going to make samples and place a sticker or a tag with the correct sample number so you will be able to refer back to them later.

SAMPLE NO. 12A -- Slip, Slide and Free Pass

1. Cast on 40 sts. with any method and knit 10 rows.

2. Set the cam for "slip" _____ with the cam lever set to knit any position except "A" (or non-working) position.

3. With all the needles in "B" position, move the cam across and end the cam at L. (You did not drop or knit any stitch.)

4. Move it across again and end the cam at R.

   NOTE: If you have separate controls for each direction, be sure to set the cam to slip in both directions or change the cam to slip to the other direction before returning the cam to the other side.

5. Pull out 20 sts. on the right side (cam side) to H.P. and knit 1 row. Cam at L. The result should be 20 sts. in H.P. at right were knitted and went into "B" position, but the other 20 sts. were not knitted.

6. Slip the cam to your right. Now the yarn is attached to the stitch in the center of the work.

7. If you are to complete this row, pull out the other 20 sts. (the left half) to H.P. and move the cam across to knit only those stitches in H.P. Cam at L.

8. Steps 5 through 7 completed 1 row only, one half at a time. Since you moved the cam 2 extra times to finish 1 row of knitting, move the row counter back by 2.

9. Set the cam to knit stockinet in normal way: _____

10. Knit 1 row. Cam is back at R.

11. Repeat the above steps until you are familiar with the device for "slip".

12. Repeat the above by reversing the L-R directions.

13. Bind off and remove the work from the machine.

SAMPLE NO. 12B -- Slip, Slide and Free Pass

1. Cast on 40 sts. with any method and knit 20 rows. Cam at R.

2. Pull out 20 needles on the cam side (right) to H.P.

3. Assume that you realize now that you had pulled out the wrong 20 needles. What you really wanted to do was: to hold the 20 sts. on the left side and knit the 20 sts. on the cam side.

4. To solve this problem, set the cam for "slip" with cam lever to knit any position except "A" position. _____

5. Knit 1 row. (You should have knitted the right half of the work and the yarn is attached to the stitch in the center, and all the needles are in "B" position.)

6. Pull out the 20 sts. on the left side which the last row did not knit. (Now you have accomplished the same result as if you had pulled out to H.P. those 20 sts. now in H.P. and knitted with the cam lever setting for short row or partial knitting.)

7. Manually wrap or automatically wrap the last stitch knitted by pulling it to H.P.

8. Change the cam lever for short row knitting _____ and knit back. Cam at R.

9. To go over the needles in "B" position and also those needles in H.P. without knitting or dropping stitches, set the cam lever to holding or short row knitting and slip.

   Cam lever setting: _____

   Move the cam across back and forth. With the combination of these 2, you can slide the cam over the stitches in any position.

10. Now remove the yarn from the yarn feeder and move the cam across without yarn. You will not drop any stitch. This is the procedure you use when you have some needles in holding, some in working and trying merely to move the cam over to the other side, in order to change color, for instance.

11. Bring the cam back to the right side and knit a couple of rows. End the cam at R.

12. Pull out all 40 sts. in H.P. To knit them all, change the cam lever setting to knit any position: _____ Release the "slip": _____

13. Knit across and end the cam at L. Pull out to H.P. all the 40 sts. again.

14. Now you have decided to knit only a part of the work on the cam side. To knit 20 sts. on the cam side (left), push into M.P. only those stitches you want to knit. Set the cam lever to knit only "B" position and M.P. but not H.P. Slip device should remain released.

    Cam lever setting: _____

15. Knit 1 row. Wrap the holding needle next to the working needles and knit back.

16. Pull out all 40 sts. into H.P. To go over the holding needles, you may slide the cam with the cam lever set to holding.

    Cam lever setting: _____

    Move the cam across back and forth with yarn in yarn feeder and also without yarn in yarn feeder.

17. Practice a little more on slip, slide and free pass with short rows. Remove the work from the machine.

SAMPLE NO. 12C -- Permanent C.O. with Slip on Every Other Needle

1. Pull out 40 needls to "B" position. Move the cam back and forth without yarn and end the cam at R.

2. Pull out to H.P. every other needle. Set the cam to knit only the holding needles:_____

3. With the yarn fed through yarn feeder of the cam, knit 1 row. Cam at L.

4. Hang the cast-on comb to pull down the loops made between needles.

5. Pull out the alternate needles which were not knitted on the last row. Knit across over the holding needles only.

6. Set the cam to knit plain (normal stockinet) knitting:_____ Release the slip device

7. Knit 40 rows and bind off.

    NOTE: This method will give you a beginning row that does not rip out from the bottom. However, it is not the best method to use as a finished edge. If you use this method to start a garment you must either add a crochet trim or turn the hem, so that this edge will end up on the wrong side of the garment.

    It may be used in starting a swatch which requires washing before charting or in beginning the waste knitting.

SAMPLE NO. 12D -- Cord Knitting

1. Cast on 3 sts. with "e" cast-on. Cam at R.

2. Set tension dial 1 to 2 tensions tighter than main tension used on garment.

3. Set the cam lever to knit to the left and slip to the right. _____

4. Knit across (Row 1).

5. Slip to R (Row 2). This time it did not knit.

6. Move the cam back and forth until you knit 60 rows. (R.C. registers 120.)

7. Transfer both end sts. to the center stitch and hand knit this stitch.

8. Cut the yarn and slip through this last stitch.

REVIEW

Since this is one of the key areas of the operating procedures, let's review and test what you have learned.

1. What is the name of the device on your particular machine which allows you to move the cam (carriage) without knitting or dropping stitches?

_____

2. Is there one control on your machine or are there two separate controls to control the movements to each direction? _____

3. If there are two separate controls, which one controls the movement of the cam to the right? _____ And which one controls the movement to the left? _____

4. How do you release the "slip" when you want to get back to the normal knitting? Circle one.

   a. By returning the lever to knitting or some other position.

   b. By pushing the button(s) labeled: _____

   c. By pushing or pulling the same button(s) into another position.

   d. Other means. Describe: _____

5. What is the proper setting of the cam lever to slip the cam across:

   a. If all the stitches are in "B" position? _____

   b. If some of the needles are in H.P. and the rest in "B" position and:

      1) You want to slip the cam across all of those stitches in H.P. and "B" position?

      _____

      2) You want to slip across the stitches in H.P. and knit the stitches in "B" position?

      _____

      3) You want to slip the cam across over the stitches in "B" position and knit only the stitches in H.P.?

      _____

6. To get back to normal knitting, set the cam to: _____

Remember the relationship between the cam lever and the needle positions. Before you move the cam across the needle bed, stop and think:

   a. Where are the needles? Are they all in one position or more than one?

   b. If there are some in "B" position and some in H.P., determine which ones you want to knit and their relationship to the cam.

   c. Determine the correct combination of the cam lever setting and "slip" device in each situation.

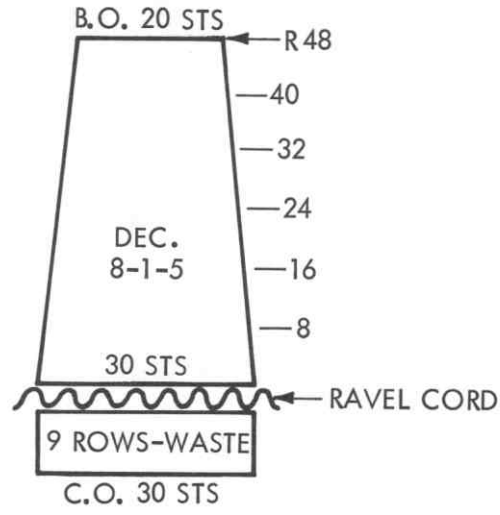
Remember, the row counter is registering every time you move the cam across the needle bed whether you knit or not. Don't forget to reset the row counter before resuming your knitting.

CHAPTER 7 DECREASING METHODS

In this lesson you will make samples with the same number of stitches and rows, and the same number of decreases, but using different methods. Make a sample of each method and place a sticker or a tag with the sample number on it to show which method you used. You may use different colors.

Each piece is made as follows:

1. Cast on 30 sts. and knit 9 rows with waste yarn.
2. Knit 1 row with ravel cord. End the cam at R.
3. Turn the row counter to 000.
4. Pull out to H.P. all 30 sts. and "e" cast on with main color.
5. Knit 8 rows and end the cam at R.
6. Decrease 1 stitch each at both sides. See instructions for different decreasing methods beginning with Sample No. 13.
7. Repeat Steps 5 and 6 above 4 more times, making altogether 5 decreases on each side. (Decreasing rows: 8, 16, 24, 32 and 40.)
8. Knit 8 more rows. The row counter reads 048.
9. Bind off the remaining 20 sts. Use any binding off method.
10. Pull out the ravel cord.
11. Block and mark each item with sample number.

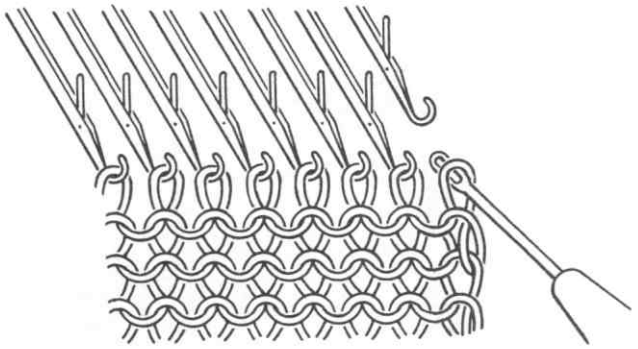


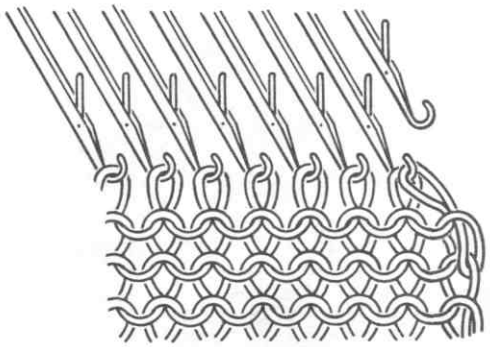
SAMPLE NO. 13 -- Simple Edge or Edge Decreasing

1. With a transfer tool, move the very edge stitch to the 2nd needle from the edge. Now the 2nd from the edge has 2 sts. on it, and the very edge needle becomes vacant.

2. Push the now vacant edge needle to "A" position (non-working). If you do not push this needle all the way back to "A" position, the cam will pick it up and knit it on the next row. As a result, you will have decreased one and picked up one and accomplished nothing.

3. Do the same on the other side.





Full Fashion Decreasing -- Sample Nos. 14 - 18

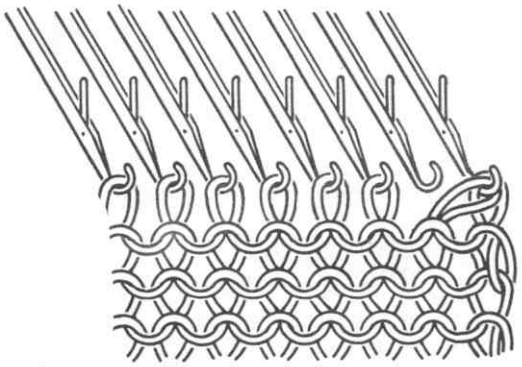
SAMPLE NO. 14

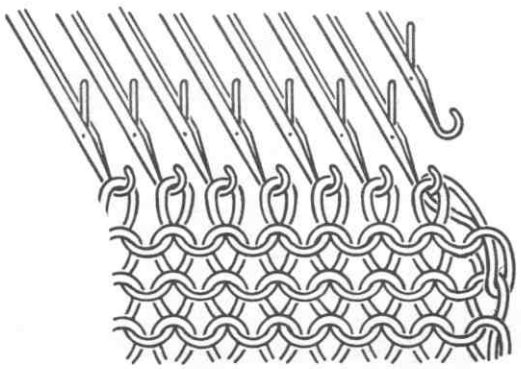
1. With a transfer tool, move the 2nd stitch from the edge to the 1st. Now the 2nd needle is vacant and the 1st needle from the edge has 2 sts. on it.

2. Move those 2 sts. to the now vacant 2nd needle, which will leave the 1st needle from the edge vacant.

3. Push back to "A" position the vacant 1st needle to take it out of work.

4. Repeat this procedure for the opposite edge.





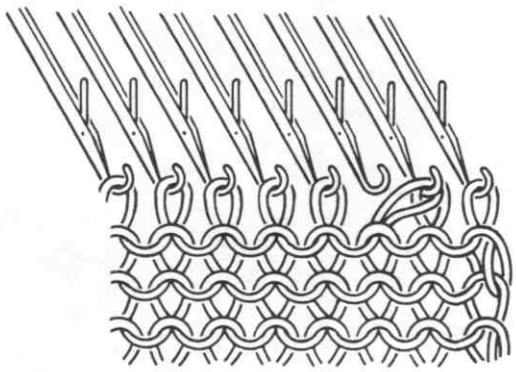
SAMPLE NO. 15

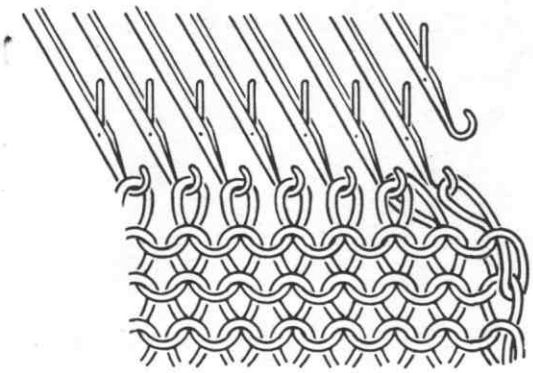
1. With a transfer tool, move the 3rd stitch from the edge to the 2nd needle from the edge. Now the 3rd needle from the edge is vacant and the 2nd needle has 2 sts. on it.

2. With a double transfer tool, transfer the stitches on the 1st and the 2nd needles from the edge to the 2nd and the 3rd, leaving the 1st needle from the edge vacant.

3. Push this vacant edge needle to "A" position to take it out of work.

4. Repeat for the other side.





SAMPLE NO. 16

1. With a transfer tool, move the 4th stitch from the edge to the 3rd needle from the edge. Now there are 2 sts. on the 3rd needle from the edge, with 1 stitch each on the 1st and 2nd needles and the 4th from the edge is vacant.

2. Move these stitches on the 1st, 2nd and 3rd needles to the 2nd, 3rd, and 4th needles, leaving the 1st needle at the edge vacant.

3. Push the vacant edge needle to "A" position to take it out of work.

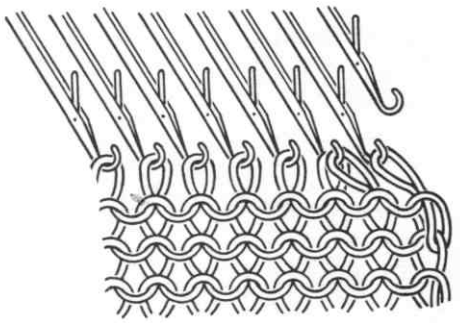
4. Do the same for the other side.

SAMPLE NO. 17

1. With a transfer tool, move the 1st and 2nd stitches from the edge over one place toward the center to the 2nd and 3rd needles. Now the 3rd needle has 2 stitches on it and the 1st needle is vacant.

2. Push the vacant needle to "A" position.

3. Do the same for the other side.

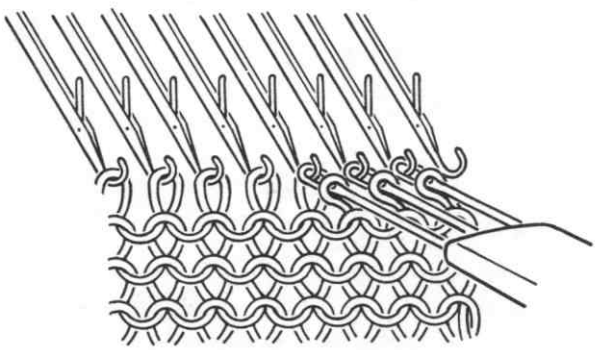


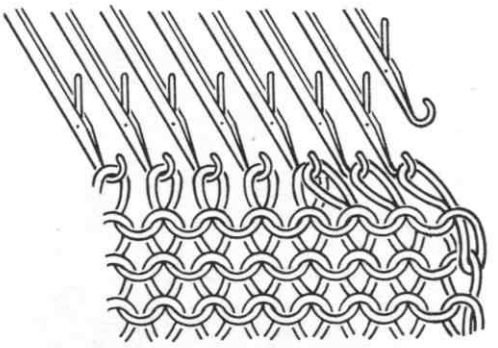
SAMPLE NO. 18

1. With a transfer tool, move the 1st, 2nd, and 3rd stitches from the edge over one place toward the center and put them on the 2nd, 3rd, and 4th needles. The 4th needle from the edge has 2 sts. on it and the 1st needle is vacant.

2. Push the vacant needle to "A" position.

3. Do the same for the other edge.





NOTE: By using the same principle, you may move the 4th to the 5th and move all those stitches to the 2nd, 3rd, 4th, and 5th. And for that matter, you may move as many number of stitches as you like so long as you have the same number of stitches brought back every time in order to form a straight line of decreased stitches on the right side.

CHAPTER 8 INCREASING METHODS

In this lesson, you are going to make samples illustrating different methods of increasing. Make each piece with a different color or place a sample number on each piece to identify the method used.

Full Fashion Increasing -- Sample Nos. 19 - 20

SAMPLE NO. 19

1. Cast on 20 sts. with "e" cast on, with or without waste knitting before making "e's".

2. Turn the row counter to 000 and cam at R.

3. Knit 6 rows and increase 1 stitch on each side as follows:

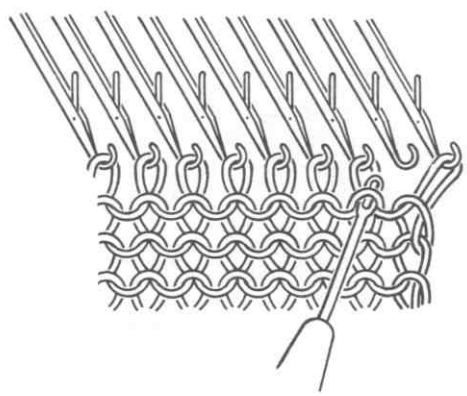
   a. With a transfer tool, move the very edge stitch to the next empty needle. Now there is an empty needle between the edge stitch and the 2nd stitch from the edge.

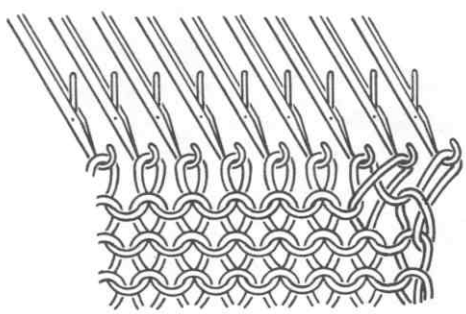
   b. Pick up the loop below the 2nd stitch and hang it on the vacant needle.

   c. Do the same for the other side.

4. Repeat Step 3 above 4 more times, making 5 increases altogether on each side. (Increasing on rows: 6, 12, 18, 24 and 30.)

5. Knit 6 more rows and remove on waste yarn or bind off.





SAMPLE NO. 20

1. Cast on 20 sts. with "e" cast on in the same manner as you did for Sample No. 19.

2. Turn the row counter to 000 and cam at R.

3. Knit 6 rows and increase 1 stitch on each side as follows:

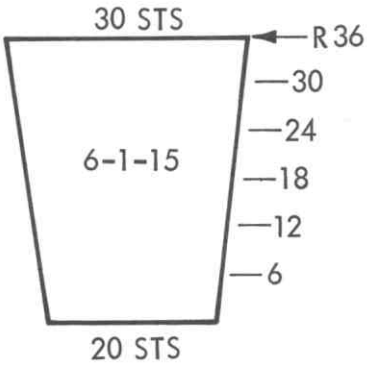
   a. With a transfer tool, move the 1st and 2nd stitches from the edge over 1 place toward the outside, making the 3rd needle from the edge vacant.

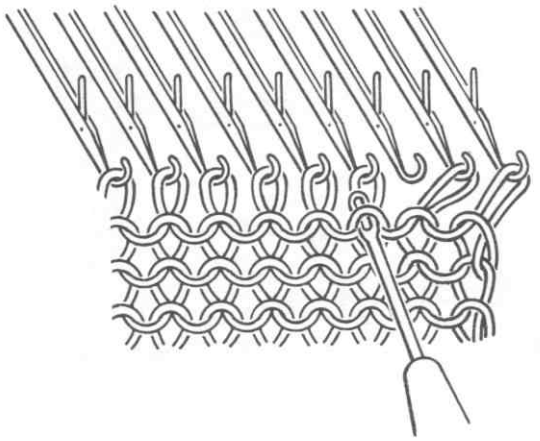
   b. Pick up the loop below the 3rd stitch and place it on the vacant 3rd needle from the edge.

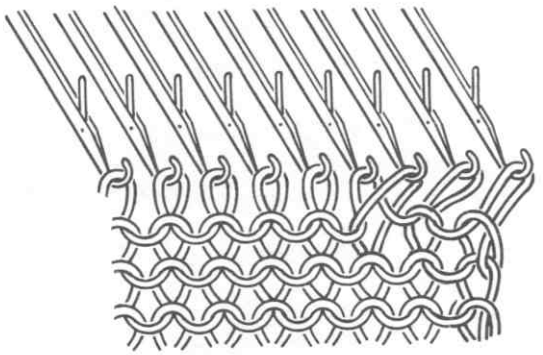
   c. Do the same for the other side.

4. Repeat the above 4 more times, making 5 increases altogether on each side. (Increasing rows: 6, 12, 18, 24, and 30)

5. Knit 6 more rows and take it off with waste yarn or bind off. (Row 36)







SAMPLE NO. 21 -- Automatic Increasing on the Cam Side

1. Cast on 10 sts. with "e" cast on, with or without waste knitting.

2. Turn the row counter to 000 and set the cam at R.

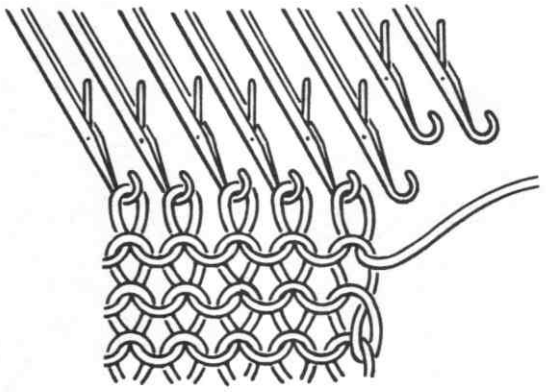
3. Knit 2 rows and end the cam at R.

4. Pull out from "A" position 1 empty needle next to the very edge stitch at right (cam side) into "B" position so that the cam will pick this up and knit on the next row.

5. Knit 1 row and end the cam at L.

6. Pull out from "A" position 1 needle next to the edge stitch on the cam side to W.P. Knit 1 row. Cam ends at R.

7. Repeat the above 2 rows until there are 30 sts. in working. Bind off.



SAMPLE NO. 22 -- Automatic Increasing on the Opposite Side of the Cam

The only difference between this method of automatic increasing and Sample No. 21 is that in this sample you pull out 1 needle at the opposite end of the work from the cam to increase 1 stitch.

1. Cast on 10 sts. with "e" cast on, with or without waste knitting.

2. Turn the R.C. to 000 and set the cam at R.

3. Knit 1 row. Cam at L.

4. Pull out 1 needle right next to the right edge of the work into "B" position from "A" position and knit 1 row. Cam ends at R.

5. Pull out 1 needle right next to the left edge of the work into "B" position from "A" position and knit 1 row. Cam ends at L.

6. Repeat the above 2 rows until you have increased 10 sts. on each side (30 sts. in working).

7. Knit 1 row and bind off.

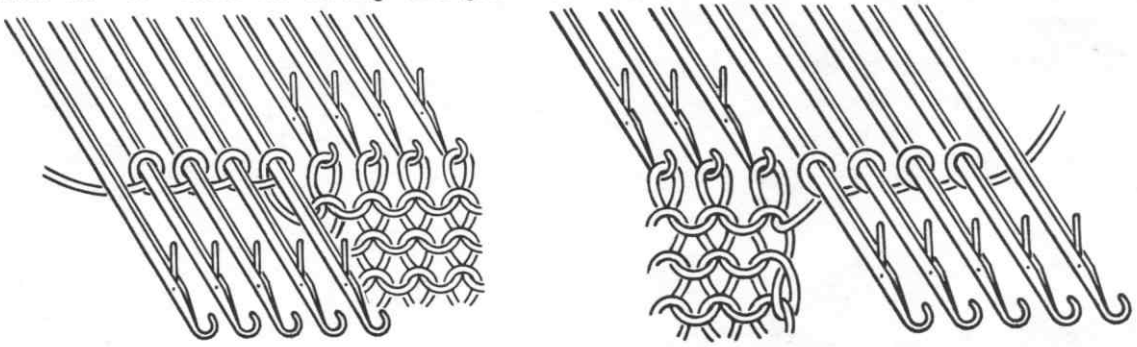
Note the difference in the increased edge. Sample No. 21 has a large loop on the edge, while Sample No. 22 has a neat finished edge.

SAMPLE NO. 23 -- Increasing More than One Stitch at a Time

1. Cast on 20 sts. and knit 20 rows. Cam at R.

2. Pull out from "A" position 5 needles into working position right next to the last stitch knitted.

3. Make an "e" cast-on using the yarn connected to the last stitch knitted.



4. With the cam lever set to knit any position (_____), knit across. Cam at L.

5. Pull out from "A" position 5 needles right next to the last stitch knitted.

6. Using the yarn connected to the last stitch knitted, wrap these needles as if to make a reverse "e".

7. Knit 8 more rows and repeat the above procedure following Steps 2 through 6.

8. Knit 8 more rows and bind off.

NOTE: With some machines the needles with the "e" cast-on must be pulled forward for 3 or 4 rows to prevent the stitches from curling up and looping over the needles.

CHAPTER 9 GARMENT SHAPING

Let's practice knitting, using some of the most basic methods of making garments. You must know how to shape armholes, necklines, bust darts, hems and sleeves before you start any garment. The following are some of the things you need to know how to do, regardless of the size or style of the garments.

Remember the methods shown in the samples are but a few of the most commonly used and are not the only ways to do them. There are many imaginative knitters who have created new and exciting ways to achieve special effects in their garments. Once you get acquainted with your own knitting machine and the basic methods of operations, you too will come up with some interesting ideas.

A word of caution: DON'T be concerned with the number of stitches and rows used in the samples. You are going to be learning the steps and the procedure on the machine and not the charting. Depending on the stitch gauge of your yarn, the samples may be somewhat out of shape. However, it is imporant that you learn the step-by-step procedure in each shaping method.

Most garments are knitted from the bottom up. The hem is the first thing to consider. So, let's start with some of the ways to make hems on the machine. Then we will go into different parts of the garments you will most likely be making.

A. HEMS

SAMPLE NO. 24 -- Hung Hem with Straight Edge

1. Cast on 40 sts. with waste yarn and knit 8 to 10 rows. Change to ravel cord and knit 1 row only.
2. Turn the row counter to 000. Cam at R.
3. Turn tension dial 2 full tensions tighter (i.e., Ten. 4 if garment ten. is 6).
4. Change to garment yarn and knit 16 rows.
5. Turn tension to garment tension (Ten. 6) and knit 1 row. (R.C. reads 017.)
6. Turn tension to 1 full tension tighter than the garment tension (Ten. 5).

7. Knit 16 rows. Pick up the loops of the very 1st row of garment yarn and hang them on the corresponding needles. Each needle should have the stitch of Row 16 and a loop from the 1st row above the ravel cord. Pick up a knot at one of the edges where you are one loop short. You will be short by one since you pick up stitches upside down.

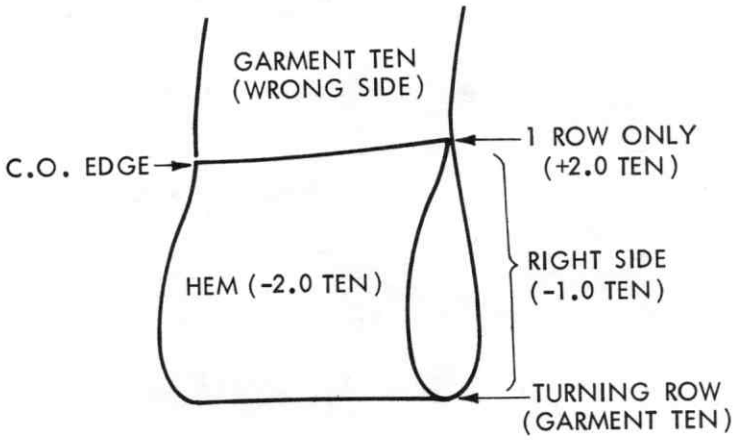
8. Turn tension dial to 2 full tensions looser than the garment tension (Ten. 8) and knit 1 row over the double stitches.

9. Turn tension to garment tension and knit 20 rows. Bind off.

10. Remove the waste knitting by pulling out the ravel cord.

11. Insert a pencil or a ruler in the hem and stretch the work lengthwise before blocking.

NOTE: These tensions are given as a rule of thumb. You must know your machine since the degree of tension changes from one number to the next varies from machine to machine.



SAMPLE NO. 25 -- Hung Hem with Picot Edge

1. Cast on 41 sts. with waste yarn and knit 8 to 10 rows. Change to ravel cord and knit 1 row.

2. Turn the row counter to 000. Cam at R.

3. Turn tension dial to 2 full tensions tighter.

4. Change to garment yarn and knit 16 rows.

5. DO NOT change tension. Instead, transfer every other stitch to the next needle to make eyelets. You may use lace maker or transfer stitches by hand.

6. Turn the row counter to 000 (hem line) and knit 1 row.

7. Change tension to 1 tension tighter than the garment tension. Knit 15 more rows (Row 16).

8. Pick up loops of the very 1st row of garment yarn and hang them on the corresponding needles. Each needle should have 2 sts. on it.

9. Turn tension dial to 2 full tensions looser than the garment tension and knit 1 row.

10. Turn tension to garment tension and knit 20 more rows. Bind off.

11. Remove the waste knitting by pulling out the ravel cord.

12. Insert a pencil or a ruler in the hem and stretch the work lengthwise before blocking.

SAMPLE NO. 26 -- Turned Hem with Straight Edge

1. Cast on 40 sts. with waste yarn and knit 8 to 10 rows. Change to ravel cord and knit 1 row.

2. Turn the row counter to 000. Cam at R.

3. Turn tension dial to 2 full tensions tighter than the garment tension.

4. Change to garment yarn and knit 15 rows.

5. Turn tension to garment tension and knit 1 row. Row counter reads 016.

6. Turn tension to 1 full tension tighter than the garment tension.

7. Turn the row counter to 000. This is the very bottom of your garment as in the case of hung hem in Sample No. 24.

8. Knit 16 rows and place a marker on this row. Pull out all the needles to H.P. and take a tapestry needle with a contrasting yarn and make a running stitch by going over and under every 2 or 3 needles.

9. Change to garment tension and knit 20 rows.

10. Bind off and remove the work from the machine. Stretch it lengthwise and block it.

11. Hold the work upside down with the knit side facing you. Fold at the ravel cord row. Slip crochet across the 1st row of the main yarn as you did in Sample No. 8.

12. Remove the waste yarn.

13. Whip the hem as you would do the hem of any garment in sewing by picking up the loops below the running stitch made in Step 8 above.

SAMPLE NO. 27 -- Turned Hem with Picot Edge

1. Cast on 41 sts. with waste yarn and knit 8 to 10 rows. Change to ravel cord and knit 1 row.

2. Turn the row counter to 000. Cam at R.

3. Turn tension dial to 2 full tensions tighter than the garment tension.

4. Change to garment yarn and knit 16 rows.

5. DO NOT change tension. Instead, transfer every other stitch to the adjacent needle to make eyelets. You may use lace maker or transfer stitches manually as in the case of Sample No. 25.

6. Turn the row counter to 000 and knit 1 row.

7. Turn tension to 1 full tension tighter than the garment tension and knit 16 more rows.

8. Place a marker on this row as you did in Sample No. 26. Change to garment tension and knit 20 rows.

9. Bind off and remove the work from the machine. Stretch it lengthwise and block it.

10. Hold the work upside down with the knit side facing you. Fold at the ravel cord row and slip crochet across the 1st row of the garment yarn as you did in Sample No. 8.

11. Remove the waste yarn.

12. Whip the hem as you did the Sample No. 26 by picking up the loops below the running stitch.

SAMPLE NO. 28 -- Mock Ribbing 1 x 1

1. Cast on 20 sts. using every other needle with "e" cast on.

2. Turn tension dial to 3 full tensions tighter than the garment tension and knit 19 rows.

3. Turn the row counter to 000 and knit 20 more rows.

4. Hang the loops of the cast on edge on the empty needles in N.W.P. (These are the every other needles which were not brought out to working when casting on every other needle in Step 1.) Altogether you should have 40 sts. in working position now.

5. Turn tension to garment tension and knit 30 rows. Bind off.

SAMPLE NO. 29 -- Hung Hem with Mock Ribbing 2 x 1

1. Pull out 41 needles to W.P. and push back every third needle to N.W.P. (28 needles are now left in working position).

2. Bring these 28 needles into H.P. and cast on with "e".

3. Turn tension to 2 full tensions tighter than the garment tension and knit 19 rows.

4. Turn the row counter to 000 and knit 20 more rows.

5. Hang the hem by placing the loops of the cast-on edge on needles in N.W.P. and one of the 2 needles in W.P. When the hem is hung, you will have 1 loop on every needle which was not working, 1 loop and one stitch on one of the 2 working needles, and 1 stitch on the other working needle.

6. There should be 41 sts. in working. Turn the tension dial to garment tension and knit 20 rows. Bind off.

NOTE: If you do not wish to have the lacy effect between the ribbing and stockinet stitch you may be able to eliminate it by picking up the adjacent stitch (on either side) from 1 row below as in the case of full fashion increasing.

SAMPLE NO. 30 -- Knit 1 Purl 1 Ribbing

1. Bring out 20 needles to W.P. (every other needle) and 1 more needle right next to the edge needle on the right side.

Needle arrangement: lololol------lolololl

1--working needle

o--non-working needle

2. Cast on with waste yarn and knit 8 to 10 rows and knit 1 row with ravel cord.

3. Turn the row counter to 000 and tension dial to 1.0 (for casting on with bound edge). Knit 3 rows with garment yarn. Cam at L.

4. On the right edge of the work, pick up the very 1st sinker loop of the garment yarn (which was formed between the 1st and 2nd stitch) and hang on the very edge needle.

5. Turn tension to ribbing tension (1 tension tighter than the garment tension for this sample) and bring out to W.P. the every other needle which have been kept out of work up to this point. 41 needles in W.P. (These E/O/N brought into working at this time will become purl stitches.)

6. Knit 13 rows (R.C. reads 016) and end the cam at R.

7. Beginning with the 3rd needle from the right edge of the work, reverse every other stitch into a purl stitch as follows:

   a. Pull forward the needle to bring the stitch in the hook to behind the latch.

   b. Drop this titch by pushing the needle back toward "A" position.

   c. Unravel to the 1st row of garment yarn.

   d. Holding the work with your left hand, insert the latch tool under the 1st sinker loop of main yarn, skip 2 loops and insert the latch tool under the 4th loop of the main yarn (2 loops on latch tool now).

   e. Pull this 2nd loop through the 1st loop and end with 1 loop only.

   f. Latch up the rest to the last row by inserting the latch tool under the loop right above, and pulling through the previous loop. Hang the last loop back on the needle.

8. After all the purl stitches are reversed and rehung, knit 20 to 30 rows in stockinet at garment tension and bind off with any method.

B. BASIC BODICE

SAMPLE NO. 31 -- Shaping Armhole

1. Cast on 60 sts. with any method and knit 30 rows (cam at R). Turn the row counter to 000.

2. Pull out 3 needles next to the cam (R) to H.P. and bind off those 3 sts. with a latch tool. Hook the last stitch left on the latch tool onto the next needle which is the 4th one from the edge. Push the 3 empty needles to N.W.P.

3. Knit 1 row and bind off 3 sts. on the cam side (L) in the same manner as you did the other side.

4. Knit 1 row. Cam is now back at R and the row counter reads 002.

5. Decrease 1 stitch on both sides of the work (see Sample No. 14).

6. Knit 1 row and decrease 1 stitch on both sides of the work (Row 3).

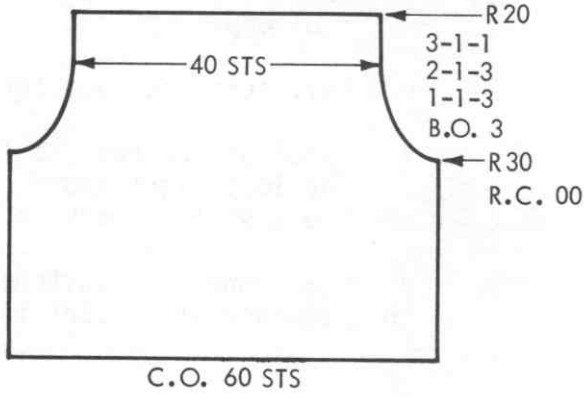
7. Repeat the above once more to make a total of 3 decreases on both sides at the rate of 1 decrease every row (Row 4).

8. Knit 2 rows and decrease 1 stitch on each side (Row 6).

9. Repeat Step 8 two more times (Rows 8 and 10).

10. Knit 3 rows and decrease 1 stitch on each side (Row 13).

11. Knit even to row 20 and bind off.



NOTE: The above armhole shaping is noted on your pattern as illustrated. Reading from bottom to top (the direction you are knitting) it means: bind off 3 sts. each side (this step takes 2 rows), every row decrease 1 stitch 3 times, every 2 rows decrease 1 stitch 3 times, every 3 rows decrease 1 stitch 1 time.

The first number stands for the number of rows between each decrease. The second number stands for the number of stitches to decrease. The third number stands for the number of times that you are to decrease.

SAMPLE NO. 32A -- Removing Back Neck and Shoulders in 3 Sections

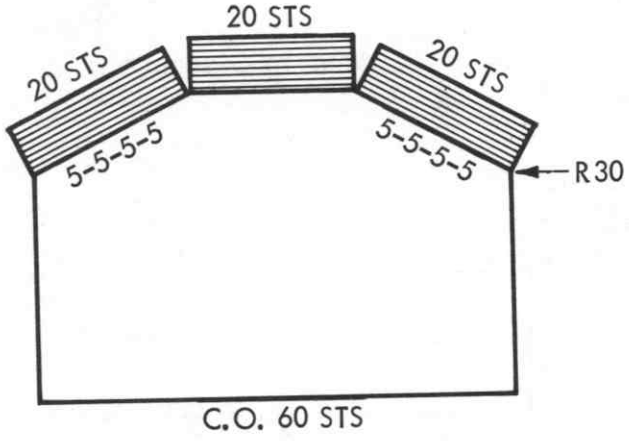
Let's assume that you have finished shaping the armhole and you are ready to shape the neckline and shoulders.

1. Cast on 60 sts. with any method and knit 30 rows. End the cam at R. Set the cam lever for short row knitting. _____

2. OPPOSITE the cam, which is the left side of the work, pull out 5 needles to H.P. and knit 1 row. Wrap the yarn around the first holding needle by placing the yarn under the first holding needle and over the rest (manual wrapping).

3. Before knitting back to the other side, pull out 5 needles to H.P. on the opposite side of the work.

4. Knit back to right. Wrap the yarn around the first holding needle.



5. Repeat Steps 3 through 5 until only the neck stitches (20 sts.) remain in W.P.

6. Set the cam lever so that you can knit stitches on needles in W.P. and M.P. _____

7. Push 20 needles at the OPPOSITE end of the work into M.P. and knit 1 row.

8. Push the other 20 holding needles on the opposite end of the work into M.P. OR change the cam lever to knit any position. Knit 1 row.

9. Pull out to H.P. the needles for the back neck (20 sts. in the center) and left shoulder which is at the opposite side from the cam, leaving only the stitches for the shoulder next to the cam in W.P.

10. Set the cam lever for short row knitting: _____

11. Change to waste yarn and knit 8 to 10 rows and remove this shoulder from the machine. Push the empty needles back to "A" position.

12. Push the needles for the back neck (20 sts. in the center) into the M.P.

13. Knit 8 to 10 rows with waste yarn and remove the work from the machine. Push the empty needles back to "A" position.

14. Set the cam lever to knit any position and knit the remaining shoulder with waste yarn 8 to 10 rows. Remove it from the machine.

SAMPLE NO. 32B -- Shaping Armhole and Shoulder--Back

To make this sample you will be combining the techniques use in Samples No. 31 and 32A.

1. Cast on 60 sts. and knit 30 rows. End with the cam on the right.

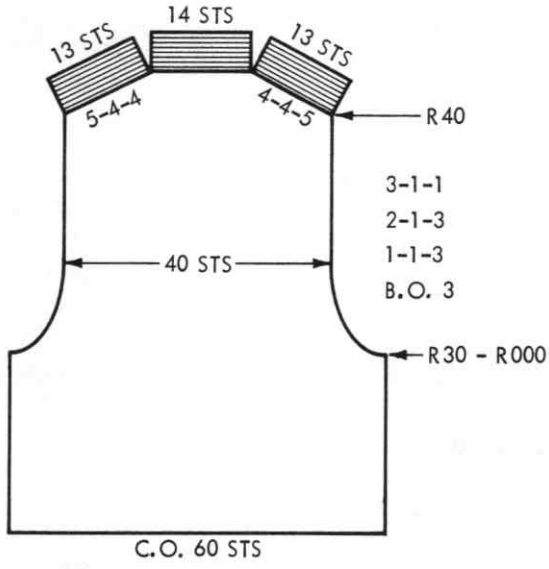
2. Turn the row counter to 000.

3. Shape armhole as you did in Sample No. 31, Steps 2 through 10. Row counter will read 013.

4. Knit even to row 40.

5. Shape the back and shoulders as you did in Sample No. 32A, holding 5 sts. first and 4 sts. twice thereafter.

6. Remove the shoulder and neck stitches on waste yarn in 3 separate sections as you did in Sample No. 32A.



NOTE: The numbers shown on the shoulder slope indicate the rate of the short row shaping (the number of stitches put into H.P. each time).

SAMPLE NO. 33 -- Shoulders and Back Neck with Center Opening

1. Cast on 30 sts. with any method and knit 30 rows.

2. Cam at R. Set the cam for short row knitting. _____

3. Pull out 4 needles to H.P. at the opposite end of the work (left side) and knit 1 row. Pull 1 more out to H.P. next to the cam (automatic wrapping). Knit back 1 row. This completes the first set of short rows.

4. Pull out 4 more needles at the opposite (left) side and knit 1 row. Pull 1 more out and knit back.

5. Repeat Step 4 above as many times as necessary until you have 10 sts. remaining in W.P. and 20 sts. held in H.P. for shoulder. Cam at R.

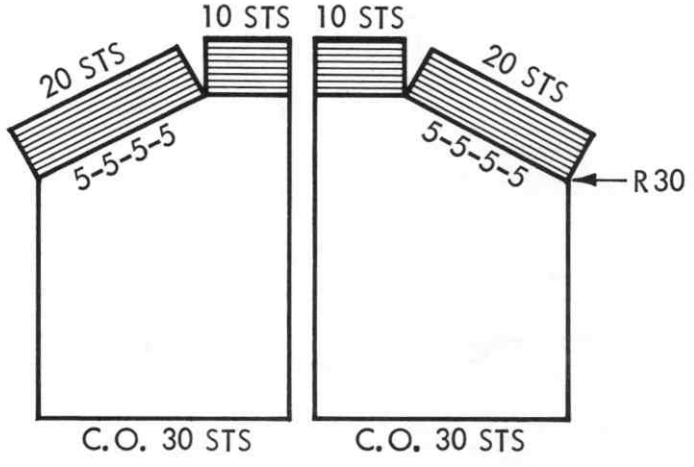
6. Set the cam lever to knit sts. in any position except in "A" which is N.W.P. _____ Knit across 1 row.

7. Pull out the neck stitches to H.P. Change the cam setting to short row knitting. _____

8. With waste yarn knit 8 to 10 rows over the shoulder stitches. Remove the shoulder from the machine. Push empty needles to "A" position.

9. Knit the neck stitches with waste yarn and remove from the machine.

10. Make the other half by reversing the L-R directions.



SAMPLE NO. 34 -- Shaping Armhole and Shoulder Center Back Opening

1. Cast on 30 sts. and knit 30 rows. Cam at R.

2. Turn the row counter to 000. Bind off 3 sts. on the right side (cam side) with latch tool.

3. Knit 1 row and decrease 1 stitch on the right side only.

4. Repeat above until you have decreased 3 times at the right side.

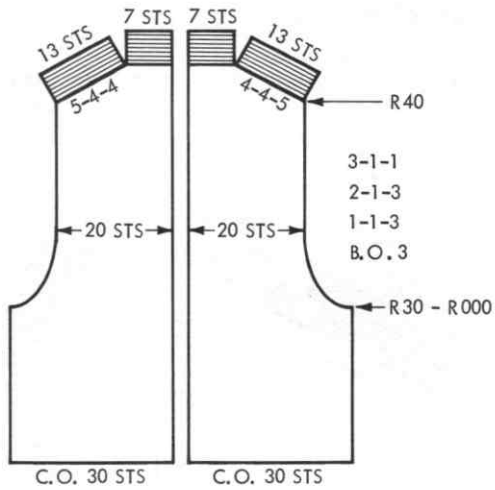
5. Knit 2 rows and decrease 1 stitch on the right side. Repeat this twice more.

6. Knit 3 rows and decrease 1 stitch. (20 sts. remain.)

7. Knit until the row counter reads 040. Knit 1 more row to bring the cam to the other side.

8. Now the cam is at the neck side (left) and you are ready to shape the shoulder. Set the cam lever for short row knitting.

9. On the right side of the work, pull out 5 needles to H.P. and knit 1 row. Wrap the 1st holding needle using manual wrapping method and knit back.



10. Pull out 4 more needles to H.P. on the right side and knit 1 row. Wrap the 1st holding needle and knit back.

11. Repeat the above once more.

12. Change the cam lever to knit any position _____ and knit across 1 row over all the stitches.

13. Remove the shoulder and neck stitches separately on waste yarn.

14. Make the other half by reversing the L-R directions.

SAMPLE NO. 35 -- Shoulder and Back Neck Shaping--Short Row Method

1. Cast on 20 sts. and knit 30 rows. Cam at R.

2. Set the cam lever for short row knitting:_____

3. On the left edge of the work, pull out 5 needles to H.P. (shoulder) and knit 1 row. Wrap the 1st holding needle (manual wrapping).

4. Pull out 5 needles at the opposite side (right side for neck) to H.P.

5. Wrap the 1st holding needle by placing the yarn under the 1st holding needle (manual wrapping), and pull out 1 more needle to H.P. Place yarn under this needle which was just pulled out to H.P.

6. Pull out 4 more needles to H.P. on the shoulder (left) side and knit across. Cam at L. Wrap the 1st holding needle.

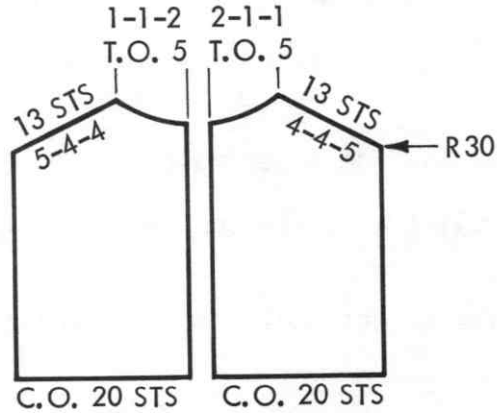
7. Pull out 1 more needle on the neck side and knit back. Wrap the yarn around this last needle held.

8. Push into M.P. the 9 needles in H.P. (shoulder side). Knit across and end the cam at L.

9. Change to waste yarn and knit 8 to 10 rows over the shoulder stitches. Remove from the machine. Push the empty needles into "A" position.

10. Set the cam lever to knit any position and knit the next stitches with waste yarn 8 to 10 rows. Remove.

11. Make the other side by reversing the L-R directions.



SAMPLE NO. 36 -- Shaping Back Neck and Shoulder in One Piece

1. Cast on 40 sts. and knit 30 rows. Cam at R.

2. Set the cam for short row knitting. _____

3. Pull out to H.P. 8 sts. in the center for back neck and all the needles that are on the left side of the 8 needles in the center.

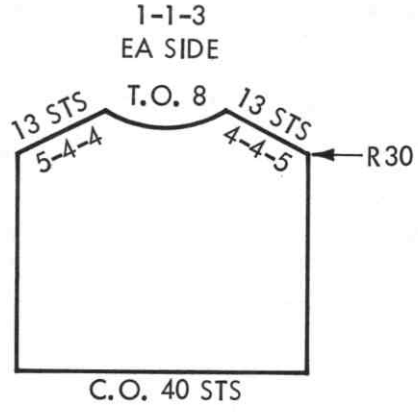
4. Knit 1 row and pull out to H.P. the last stitch knitted (automatic wrapping method) and at the same time, pull out to H.P. 4 needles on the right shoulder.

5. Knit across and pull out to H.P. the last stitch knitted (shoulder side) and 1 needle at the neck side.

6. Knit across. Pull out to H.P. 1 more at the neck side and 3 at the shoulder side.

7. Knit across (cam at R). Pull out to H.P. the last stitch knitted and knit back.

8. Push into M.P. the 9 holding needles of the right shoulder and knit the entire shoulder of 13 sts.



NOTE: Those who must change cam lever setting to do this, be sure to change it before knitting the entire shoulder.

9. Change to waste yarn and knit 8 to 10 rows. Remove this shoulder from the machine and push all the empty needles into "A" position.

10. Slide the cam to L. Cam lever must be set to _____ to slip across.

11. Push into M.P. all the needles on the left side of the 8 sts. originally in the center.

12. Set the cam lever to knit only those stitches in M.P. _____ Knit across.

13. Pull out to H.P. the last stitch knitted and 4 needles at left. Knit back to L.

14. Pull out to H.P. the last stitch knitted and 1 needle at the neck side.

15. Knit 1 row. Pull out to H.P. 1 more at the neck side and 3 needles on the shoulder side.

16. Knit 1 row and pull out the last stitch knitted. Knit back. Cam is on the neck side now.

17. Push into M.P. the 9 holding needles and knit the entire shoulder.

18. Remove this shoulder using waste yarn. Push all the empty needles into "A" position and remove the 14 neck stitches on waste yarn.

SAMPLE NO. 37 -- Shaping Front Neck and Shoulder with Center Opening

Let's assume you have finished shaping the armhole and you are ready to shape the front neckline.

1. Cast on 20 sts. with any method and knit 20 rows. End the cam at L.

2. Front Neck Shaping: Bind off 2 sts. on cam side and knit back.

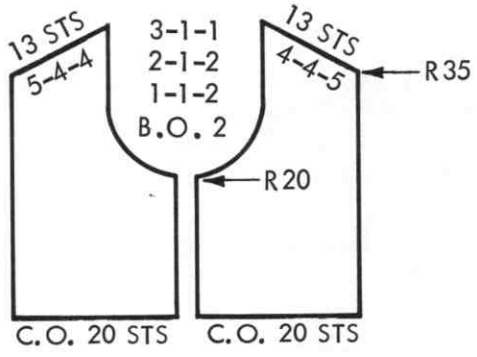
3. Decrease 1 stitch on the neck side, knit 1 row and decrease 1 more stitch on the neck side.

4. Knit 2 rows, decrease 1 stitch on the neck side. Repeat this once more.

5. Knit 3 rows and decrease 1 more stitch (13 sts. remain).

6. Knit even until the row counter reads 035.

7. Shape the shoulder in short rows (5 sts., 4 sts. and 4 sts.) with either manual or automatic wrapping method.



8. Remove the work on waste yarn.

9. Make another front to match by reversing the L-R directions.

SAMPLE NO. 38 -- Shaping Armhole, Front Neck and Shoulder

1. Cast on 30 sts. with any method and knit 30 rows. (Cam at R.)

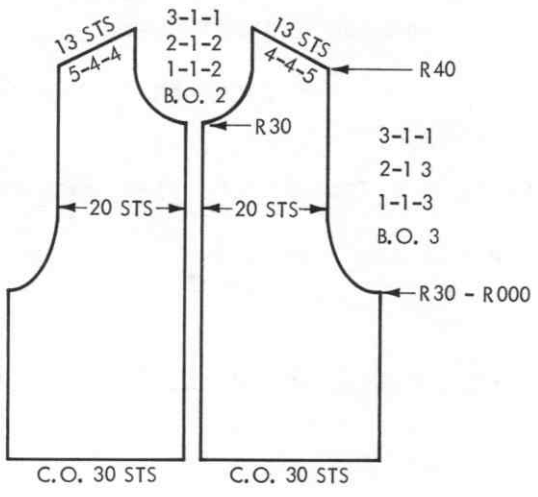
2. Turn the row counter to 000 and bind off 3 sts. with latch tool.

3. Knit 1 row and decrease 1 stitch on the right side only. Repeat this twice more. (Dec. 1 st. every row 3 times.)

4. Knit 2 rows, decrease 1 stitch on the right side. Repeat this 2 more times. (Dec. 1 st. every other row 3 times.)

5. Knit 3 rows and decrease 1 stitch on the right side. Knit even until the row counter reads 030. Cam at R.

6. Knit 1 more row to bring the cam to center front in order to shape the neckline front (1 extra row).



7. Bind off 2 sts. at the center front.

8. Knit 1 row and decrease 1 stitch at the neck side. Repeat this once more.

9. Knit 2 rows and decrease 1 stitch. Repeat this once more.

10. Knit 3 rows and decrease 1 stitch. 13 sts. remain.

11. Knit even until the row counter reads 040

12. Move the cam to L (1 extra row again) and shape the shoulder with short rows as indicated in the diagram.

13. Remove the work with waste yarn.

14. Make the other front by reversing the L-R directions.

SAMPLE NO. 39 -- Armhole, Front Neck and Shoulder Shaping in One Piece

1. Cast on 60 sts. with any method. Knit 30 rows and end the cam at R.

2. Turn the row counter to 000.

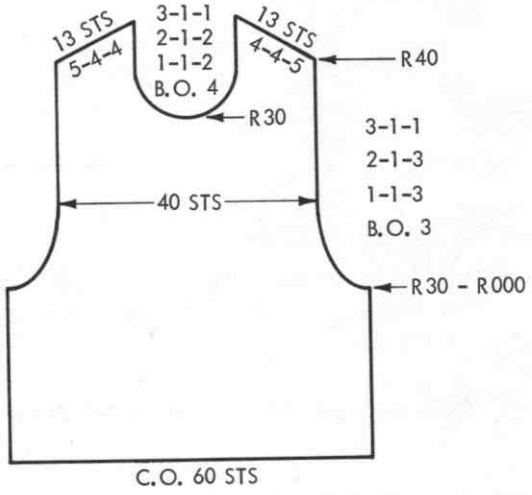
3. Bind off 3 sts. at the armhole side and knit 1 row. Bind off 3 sts. for the other side and knit back.

4. Decrease 1 stitch on each side now. (This is the 1st of 3 decreases every row 3 times.) Knit 1 row and decrease 1 stitch on each side twice more.

5. Knit 2 rows and decrease 1 stitch on each side. Repeat this 2 more times.

6. Knit 3 rows and decrease 1 stitch on each side.

7. Knit even until the row counter reads 030. Cam at R.



8. Change to ravel cord and knit 1 row.

9. Pull out to H.P. the needles for front neck bind off (4 sts.) and all the needles which are on the right side of the front neck opening. Only the stitches for the left shoulder are now in working position.

10. Set the cam lever for short row knitting and knit these stitches in W.P. with scrap yarn. Remove these stitches from the machine. Don't forget to push the empty needles back to N.W.P.

11. Push the needles for front neck bind off (4 sts. in the center) to M.P. manually. Knit 1 row with ravel cord to bring them into W.P.

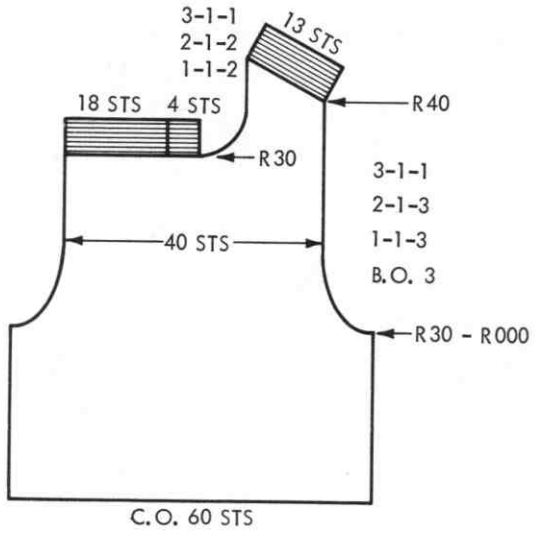
12. Rip out the 2 rows of ravel cord knitting for these 4 sts. only. Leave ravel cord attached to stitches on both sides.

13. Change to waste yarn and knit several rows over center 4 sts. Remove these stitches from the machine. Now only the stitches that remain on the machine are for the right shoulder.

14. Knit 1 row with ravel cord and bring these needles into working position.

15. Rip out these 2 rows of ravel cord. Original garment stitches are on the needles now.

NOTE: All these extra steps (8-15) are taken in order to eliminate the dark mark you tend to get on the garment when one side of the neck opening is removed on waste yarn.



16. Set the row counter back to 030.

17. Knit 1 row and decrease 1 stitch using the same method used in armhole shaping. This decrease is made on the neck side (NOT the armhole side). Repeat this once more.

18. Knit 2 rows and decrease 1 stitch at the neck side. Repeat this one more time.

19. Knit 3 rows and decrease 1 stitch on the neck side.

20. Knit until the row counter reads 040. If the cam is not on the neck side, knit 1 more row to bring the cam on the neck side.

21. Shape the shoulder with short rows as you did before on other samples.

22. Remove this shoulder using waste yarn.

23. Rehang the stitches removed on ravel cord and waste yarn on the other side. Be sure to remove the scrap yarn and ravel cord after hanging the work back on the machine. Leave center 4 sts. on their own waste yarn.

24. Shape the front neckline in reverse. Knit even until the row counter reads 040.

25. Shape the shoulder also in reverse. Remove this shoulder from the machine using scrap yarn.

SAMPLE NO. 40 -- Bust Darts, Armhole, Front Neckline and Shoulder Shaping

1. Cast on 60 sts. with any method. Knit 20 rows and end the cam at R.

2. Set the cam lever for short row knitting:_____

3. Pull out 4 sts. to H.P. at the opposite side (L) from the cam and knit 1 row. Wrap the 1st holding needle with the yarn connected to the last stitch knitted (manual wrapping).

4. Pull out 4 needles on the opposite side (R) to H.P. and knit 1 row.

5. Continue to short row in this manner until all 16 sts. for bust darts are held out to H.P. on both sides (Row 18).

6. Push into M.P. the 16 holding needles on the opposite side of the cam (L) and knit with the proper cam lever setting to knit these stitches.

   _____ Cam at L.

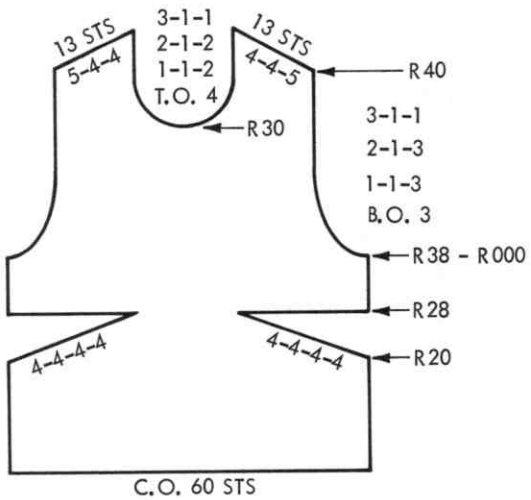
7. Knit across the entire work including the other 16 sts. held in H.P.

8. Knit even until the row counter reads 038. Cam at R.

9. Shape armhole as in Sample No. 31.

10. Knit even until R.C. reads 030.

11. Front neck shaping: Follow the procedure described in the previous sample, Steps 8 through 25.



SAMPLE NO. 41 -- Shaping Front Neckline and Shoulders--Short Row Method

1. Cast on 60 sts. and knit 20 rows. Cam at R.

2. Set the cam lever to short row knitting:_____

3. Pull out to H.P. 6 sts. in the center and all the needles on the left side of those center 6 sts.

4. Knit 1 row and bring out to H.P. the last stitch knitted. Knit back to R and pull out 1 more needle to H.P.

5. Repeat Step 4 once more.

6. Knit 1 more row (cam on the neck side) and pull out 1 more needle to H.P. Knit back.

7. Repeat Step 6 above 2 more times (20 sts. remain).

8. Knit even until R.C. reads 035. Cam at L (on the neck side).

9. Set the cam lever for short row knitting:_____ Shape the shoulder as indicated in the diagram using either manual or automatic wrapping method.

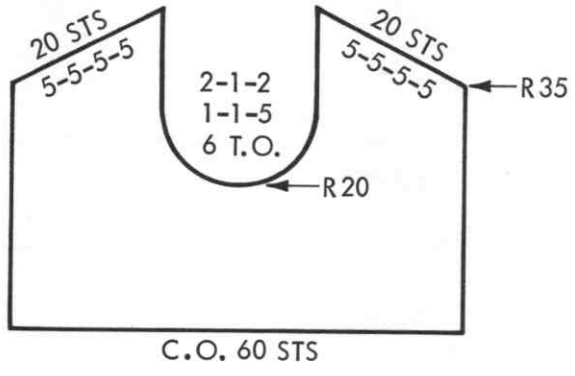
10. When the cam is on the neck side and 5 sts. remain in working, push all the shoulder stitches that were in H.P. into M.P. and knit back to right. (All the shoulder stitches are in W.P. now.) Remove this shoulder on waste yarn.

11. Slide the cam to left side of the work and reset the row counter to 20.

12. Push into M.P. all the needles that are on the left side of the center 6 sts.

13. Shape this side of the front neck by reversing L-R directions of the procedure described in Step 4 through 10.

14. Remove on waste yarn all the neck stitches in H.P.

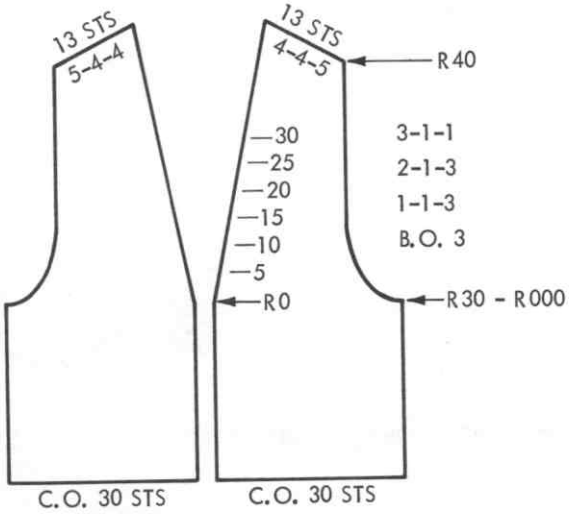


SAMPLE NO. 42 -- V-Neck Front in 2 Pieces

1. Cast on 30 sts. and knit 30 rows. Turn the row counter to 000.

2. Bind off 3 sts. on the cam side. At the same time, decrease 1 stitch on the other side (point of V) using the method shown in Sample No. 14. Place a marker where you made the decrease by pulling through a loop of contrasting yarn with your latch tool.

3. Shape the armhole as the other samples by decreasing 1 stitch every row 3 times, every other row 3 times and once after 3 rows. At the same time, shape the V on the neck side by decreasing 1 stitch every 5 rows as indicated (13 sts. remain).



Decreasing Rows

V-Neck	Armhole
R. 0	R.0 B.O. 3
5	Rs. 1, 2 & 3
10	Rs. 5, 7 & 9
15	R. 12
20	
25	
30	

4. Knit even until the row counter reads 040.

5. Shoulder shaping: Short row knitting with either automatic or manual wrapping method as in other samples.

6. Make another piece to match by reversing the L-R directions.

SAMPLE NO. 43 -- V-Neck Front in One Piece

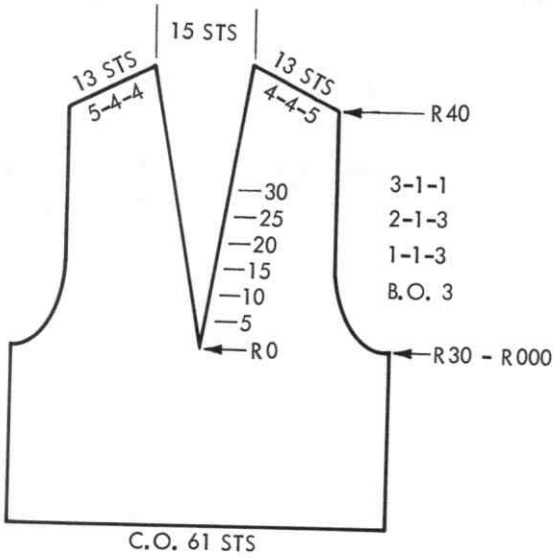
1. Cast on 61 sts. and knit 30 rows. Cam at R.

2. Remove the center stitch on contrasting yarn as if to place a marker.

3. Remove on waste yarn all the stitches to the left side of the center stitch.

4. Turn the row counter to 000. Bind off 3 sts. on the cam side for armhole and decrease 1 stitch on the neck side. Use the method shown in Sample No. 14.

5. Shape the armhole and V-neck in the same manner as the last sample.



Decreasing Rows

V-Neck	Armhole
R. 0	R. 0 B.O. 3
5	Rs. 1, 2 & 3
10	Rs. 5, 7 & 9
15	R. 12
20	
25	
30	

6. Remove the shoulder stitches on waste yarn.

7. Rehang the left half of the work that was removed on waste yarn in Step 3 back on the original needles.

8. Knit the other side in the same manner by reversing the armhole and neckline shaping.

JOINING SHOULDERS -- Sample Nos. 44 - 46

SAMPLE NO. 44

1. Make another sample of No. 32A and No. 40.

2. Hang the shoulder stitches of Sample No. 40 (on the machine) with the right side (knit side) facing you.

3. Count the stitches to make sure none are missing.

4. Hang the matching shoulder of Sample No. 32A with the purl side facing you (the 2 right sides are together).

5. Knit 1 row with 1 tension tighter and bind off with latch tool. Remove the waste yarn.

6. On the other shoulder, bind off immediately after hanging both sets of shoulder stitches without knitting 1 row. Use the same binding off method.

SAMPLE NO. 45

1. Make another set of samples as for the last set.

2. Hang one shoulder with the right side facing you. Count the stitches to make sure you have not dropped any.

3. Hang the matching shoulder with the wrong side facing you (two right sides together).

4. Knit 1 row with 1 tension tighter and bind off with tapestry needle.

5. Hang the other shoulder in the same way. Bind off immediately after hanging the shoulder stitches. Do not knit 1 row.

6. Remove the waste yarn.

SAMPLE NO. 46

1. Make samples using No. 32A and No. 35.

2. Hang one of the shoulders with the right side facing you. Count the stitches.

3. Remove the waste yarn.

4. Hang the matching shoulder with the wrong side facing you to have the 2 right sides together.

5. Pull out the needles toward you until the stitches of the 1st shoulder go behind the latches. The stitches of the 2nd shoulder (the ones in front) remain in the hook of the needles.

6. Push back the needles far enough until these stitches knit.

7. Bind off using latch tool or tapestry needle.

C. SET-IN SLEEVE

SAMPLE NO. 47 -- Sleeve (Knitted up)

1. Cast on 28 sts. with any method.

2. Knit 6 rows and increase 1 stitch on each side using one of the full fashion methods from earlier samples.

3. Repeat Step 2 above 7 more times until there are 44 sts. in working.

4. Knit even until the row counter reads 054. End the cam at R.

5. Turn the row counter to 000 and bind off 3 sts. on the cam side.

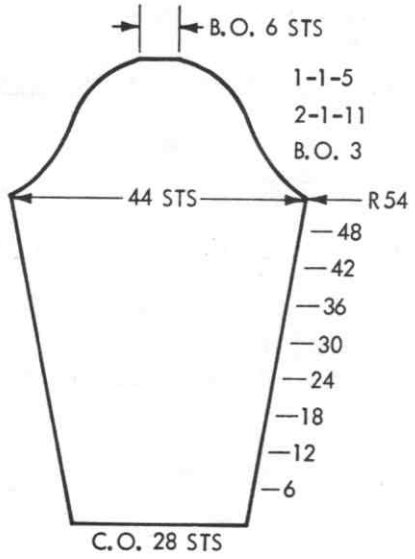
6. Knit 1 row (cam at L) and bind off 3 sts.

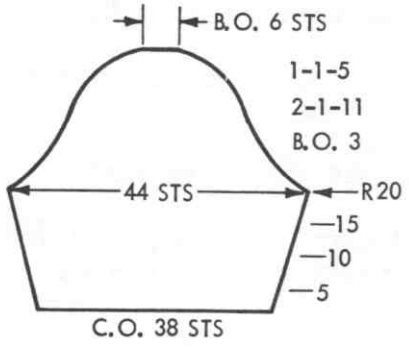
7. Knit 1 row (cam at R and R.C. reads 002) and decrease 1 stitch on both sides of the work. DO NOT use full fashion method. Use simple edge decreasing method.

8. Knit 2 rows and decrease 1 stitch on each side. Repeat this until 16 sts. remain (Row 22).

9. Knit 1 row and decrease 1 stitch on each side. Repeat this 4 more times. 6 sts. remain in working.

10. Knit 1 row and bind off with tapestry needle.





SAHPLE NO. 48 -- Short Sleeve (Application of Sample No. 47)

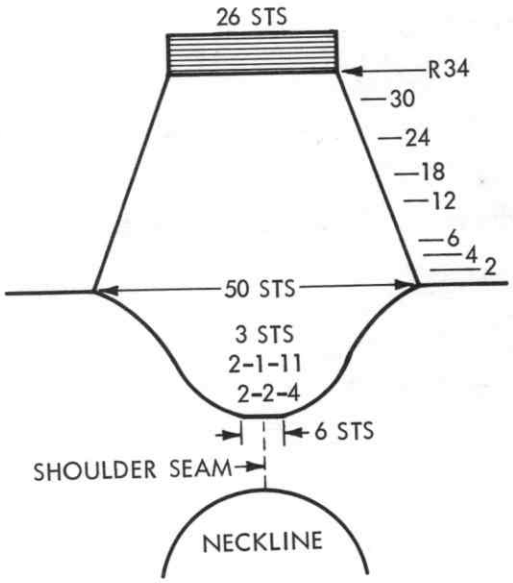
1. Cast on 38 sts. with any method and knit 20 rows with 3 increases on each side of the work at the rate of 1 stitch every 5 rows. 44 sts. in working. (Increasing rows: 5, 10, and 15.)

2. Follow Steps 5 through 10 of Sample No. 47 for sleeve cap.

SAMPLE NO. 49 -- Hung Sleeve (Knitted Down)

1. Make a set of samples using No. 32 (Back) and Sample No. 42 (V-Neck Front). Join shoulders using any method.

2. Hang the armhole by picking up 50 sts. from the vertical edge of the armhole and bound stitches. Be sure the purl side is facing you. Pick up the inside half of the edge stitch along armhole, not the very edge loops. R.C. 000.



3. Turn the tension dial to 1 full tension tighter than the garment tension and knit 1 row over the entire work. (Row 1)

4. Pull out to H.P. all the needles except 6 sts. in the center.

5. Set the cam lever for increasing short rows. (Knit the stitches on the needles in "B" and middle positions but not in H.P.) Cam at L. Turn tension dial back to main garment tension.

6. Knit over on those 6 sts. in the center and wrap the yarn around the 1st holding needle. Use manual wrapping method. Cam at R and R.C. reads 002.

7. Push into M.P. 2 holding needles next to the working needles on the left side (opposite the cam) and knit 1 row. Cam at L and R.C. 003. Wrap the 1st holding needle with yarn.

8. Push 2 needles into M.P. from H.P. next to the working needles on the opposite side (right) and knit across. Cam at R and R.C. 004. Wrap the yarn around the 1st holding needle.

9. Repeat Steps 7 and 8 until there are 22 sts. in working.

10. Push 1 needle on the opposite side into M.P. and knit across. Wrap this needle by placing the yarn under the 1st holding needle.

11. Repeat Step 10 until you have increased 11 more sts. on each side (44 sts. in working). Turn the row counter to 000.

12. Push into the middle position the 3 remaining sts. on the opposite side of the cam. Knit 1 row.

13. Change the cam lever to knit any position: _____ Knit across. All the needles are in working position. (R.C. reads 002.)

14. Decrease 1 stitch on both sides of the work. Use one of the full fashion methods.

15. Knit 2 rows and decrease 1 stitch on each side. Repeat this once more.

16. Knit 6 rows and decrease 1 stitch on each side. Repeat this 3 more times. (R.C. 030)

17. Knit 4 rows and remove on waste yarn.

D. RAGLAN SLEEVE

In these lessons you will be making sets of samples with the same number of stitches and rows, but using different shaping methods. Each set will consist of one piece for back, two pieces for front. There will be different sample numbers assigned to sleeves.

SAMPLE NO. 50-A -- Raglan Shaping with Edge Decreasing--Back

1. Cast on 40 sts. with any method and knit 30 rows. End the cam at R.

2. Turn the row counter to 000. Bind off 2 sts. on the cam side and knit 1 row.

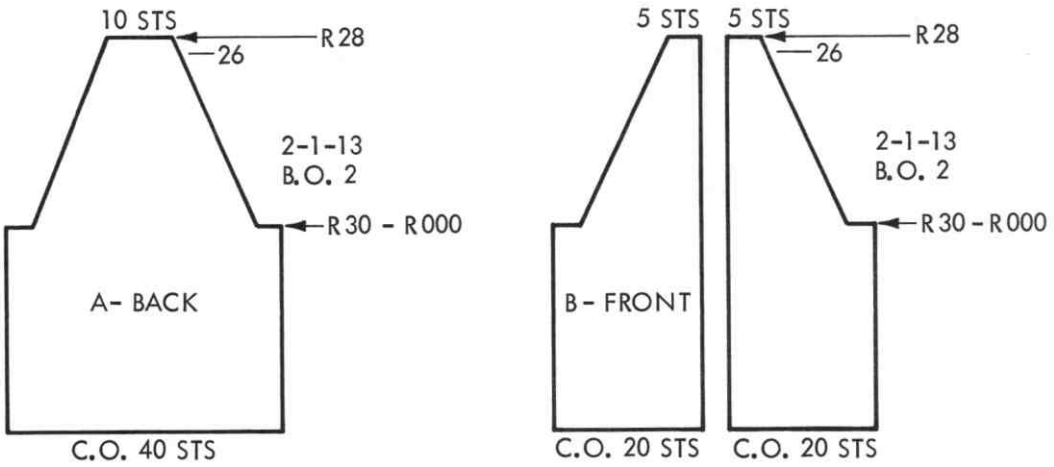
3. Bind off 2 sts. on the cam side again and knit 1 row. (Cam is at R and the row counter reads 002.)

4. Decrease 1 stitch each side using the simple edge decreasing method in Sample No. 13.

5. Knit 2 rows and decrease 1 stitch on both sides of the work as you did above.

6. Repeat Step 5 above until you have decreased 13 sts. on each side. The last decreases were made on row 26 and 10 sts. remain.

7. Knit 2 more rows (row 28) and bind off.



SAMPLE NO. 50-B -- Raglan Shaping with Edge Decreasing--Front

1. Cast on 20 sts. in the same way as you did the back and knit 30 rows.

2. Turn the row counter to 000 and bind off 2 sts. right next to the cam.

3. Knit 2 rows and decrease 1 stitch using simple edge decreasing.

4. Continue decreasing on every even number row until you have decreased 13 sts. on the armhole side. The row counter reads 026 and 5 sts. remain.

5. Knit 2 rows and bind off on row 28.

6. Make the other front by reversing the L-R direction.

NOTE: There is no neck shaping for front pieces since this is a sample on armhole shaping.

SAMPLE NO. 51-A -- Raglan Shaping with Full Fashion Decreasing--Back

1 through 3. Same as Sample No. 50-A.

4. On row 2 and every even number row, decrease 1 stitch on each side using the decreasing method in Sample No. 14 until 13 sts. have been decreased on each side. 10 sts. remain.

5. Knit 2 rows (Row 28) and bind off.

SAMPLE NO. 51-B -- Raglan Shaping with Full Fashion Decreasing--Front

1 and 2. Same as Sample No. 50-B.

3. Knit 2 rows and decrease 1 stitch on the armhole side, using the same method as Sample No. 41-A Back.

4 through 6. Same as Sample No. 50-B.

More raglan shaping: Begin and end each of these samples as you did in Sample Nos. 50-A and B and 51-A and B.

SAMPLE NO. 52-A (Back) and B (Front)

Use the decreasing method in Sample No. 15.

SAMPLE NO. 53-A (Back) and B (Front)

Use the decreasing method in Sample No. 16.

SAMPLE NO. 54-A (Back) and B (Front)

Use the decreasing method in Sample No. 17.

SAMPLE NO. 55-A (Back) and B (Front)

Use the decreasing method in Sample No. 18.

After making each set of samples, be sure to attach a tag or a tape to identify the decreasing method used. You may differentiate by changing colors for each sample.

SAMPLE NO. 56-A -- Raglan Shaping Every 4 Rows--Back

1. Cast on 42 sts. with any method and knit 30 rows. End the cam at R.
2. Turn the row counter to 000. Bind off 2 sts. on the cam side and knit 1 row. Cam at L.
3. Bind off 2 sts. on the cam side again and knit back to the right. R.C. 002. There are 38 sts. on the needle bed, 19 sts. on each side of 0 in the center.
4. With 3 x 1 transfer tool, move 3 sts. from the edge by 2 places toward the center of the work. This means the stitches on needles #17, #18, and #19 will go onto the needles #15, #16, and #17 and the needles #15 and #16 will have 2 sts. each and 1 stitch on #17.
5. Do the same for the other side.

6. Knit 4 rows and decrease 2 sts. on each side as in Steps 4 and 5 above.

7. Repeat the above 5 more times until 10 sts. remain (Row 26).

8. Knit 2 more rows and bind off on row 28.

SAMPLE NO. 56-B -- Raglan Shaping Every 4 Rows--Front

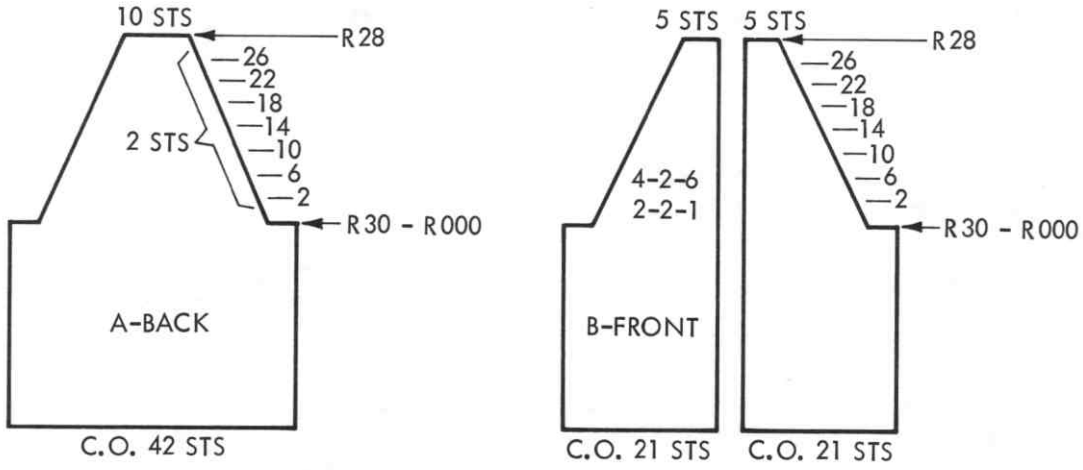
1. Cast on 21 sts. the same as you did for the back. Knit 30 rows.

2. Turn the row counter to 000. Bind off 2 sts. on the cam side and knit 2 rows.

3. Decrease 2 sts. on the cam side (armhole side) the same as you did for the back on this row and every 4 rows until 5 sts. remain. (Decreasing rows: 2, 6, 10, 14, 18, 22 and 26)

4. Knit 2 more rows and bind off.

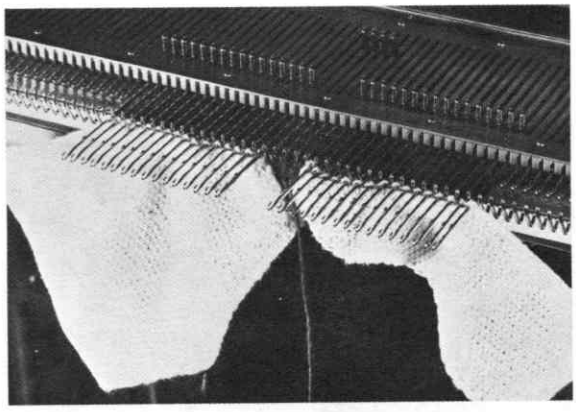
5. Reverse the L-R direction and make the matching front.

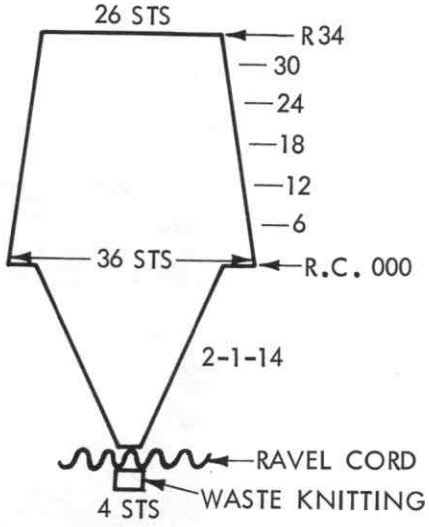


SAMPLE NO. 57 -- Hung Raglan Sleeve--Automatic Increasing (Cam Side)

1. Cast on 4 sts. (for sleeve cap) using waste yarn in the center of the machine. Knit several rows and knit 1 row with ravel cord.

2. Take Sample No. 50-A and B and hang the armholes of the front and back on both sides of 4 sts. in the center, placing the neck edge on the 3rd needle from the center (the 1st empty needle) and pick up every other row (or every loop) and the 2 bound stitches at the end. You should have picked up 16 sts. on each side of the sleeve cap, making the total of 36 sts. on the machine.





3. Pull out to H.P. all the needles except 4 sts. in the center.

4. Turn the row counter to 000 and set the cam lever for increasing short row so that you can knit stitches in "B" and the middle positions but not the stitches in H.P.

5. With a 2nd color knit 1 row only over the 4 sts. in the center. Be sure to have the end of the yarn hanging between the needles in "B" position and the needles in H.P. on the cam side before starting this 1st row. Cam at L.

6. Push into M.P. the needle next to the last stitch knitted so that it will be knitted on the next row. Knit across 1 row. You have just increased 1 stitch on the left side and the cam ends at R.

7. Push into M.P. the needle next to the last stitch knitted. Knit across 1 row. You have just increased 1 stitch on the right side of the work. Cam at L.

8. Continue to increase stitches as in Steps 6 and 7 until 3 sts. remain in H.P. on the cam side and 2 sts. are in H.P. opposite the cam.

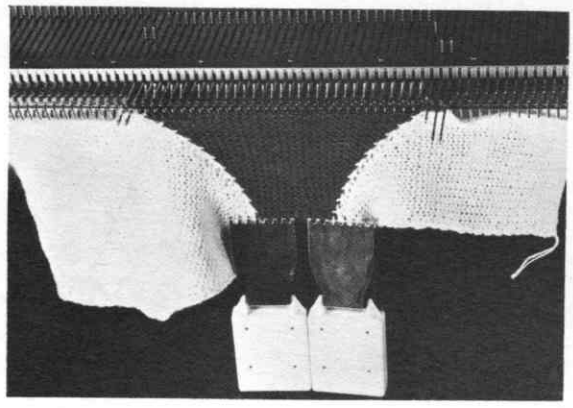
9. Turn the row counter to 000. Push into M.P. the 3rd stitch (in H.P. on the cam side) and 2 sts. (in H.P.) on the opposite side and knit 1 row. This is the 1st row of the underarm portion of the sleeve.

10. Push into M.P. the remaining 2 sts. on the other side (OR change the cam lever to knit stitches regardless of needle positions) and knit across. This is the 2nd row of the underarm portion of the sleeve.

11. Decrease 1 stitch on each side using one of the full fashion methods on this row and on row 4 and row 6 (every other row 3 times altogether).

12. Knit 6 rows (row 12), decrease 1 stitch on each side. Repeat this 3 more times. Decrease rows: 12, 18, 24 and 30.

13. Knit 4 rows and bind off.



SAMPLE NO. 58 -- Hung Raglan Sleeve--Automatic Increasing with Manual Wrapping

1. Cast on 4 sts. for sleeve cap as in Sample No. 57.

2. Using Sample No. 53-A and B, hang the armholes of front and back as in Sample No. 57.

3. Pull out to H.P. all the needles except 4 sts. in the center.

4. Turn the row counter to 000 and set the cam lever for increasing short row knitting.

5. With the yarn for sleeve, knit 1 row over the 4 sts. Cam at L.

6. Manually wrap the yarn around the 1st holding needle to your left which is the 3rd needle from the center. AND AT THE SAME TIME, push into the middle position the 1st holding stitch on the opposite side (right side) and knit 1 row. Cam at R.

7. Manually wrap the yarn around the 1st holding needle which is immediately adjacent to the right. AND AT THE SAME TIME, push into the middle position the needle you had wrapped on the previous row on the opposite side. Knit 1 row.

8. Again manually wrap the yarn around the next stitch to your left which is the 1st holding needle. AND AT THE SAME TIME push into the middle position the very needle you had wrapped the yarn around on the previous row. Knit across.

9. Repeat the above procedures in Steps 7 and 8 until there are 2 sts. remaining in H.P. on each side.

10. Turn the row counter to 000 and push into the middle position the 2 sts. in H.P. on the opposite side of the cam and knit across.

11. Change the cam lever setting to knit stitches in any position and knit across. Those are the first 2 rows of the underarm portion of the sleeve.

12. Do the rest of the sleeve shaping as in Sample No. 57.

SAMPLE NO. 59 -- Raglan Sleeve--Knitting Separately

1. Cast on 22 sts. with any method and knit 4 rows.

2. On row 4 and every 6 rows thereafter until row 28 increase 1 stitch on each side. Use full fashion method. (Increasing rows: 4, 10, 16, 22, and 28) 32 sts. in working.

3. Increase 1 stitch on each side every other row twice. (Increasing rows: 30 and 32) Knit even until row 34. 36 sts. in working.

4. R.C. to 000. Bind off 2 sts. on the cam side.

5. Knit 1 row and bind off 2 sts. again on the cam side. Knit back (row 2).

6. On row 2 and every even numbered row thereafter, decrease 1 stitch on each side until you have decreased 13 times altogether. Use the same decreasing method used for the armhole of Sample No. 54-A and B. Last decreasing is on row 26 and 6 sts. remain.

7. Knit 2 rows and bind off on row 28.

8. Weave the sleeve into the armhole as you do the side seam.

Chapter 10 Using Garter Bar

The garter bar is a very handy gadget when you learn to use it and have mastered the techniques. It is used mainly in the following situations:

1. Transferring more than a few stitches at a time. Multiple decreasing or multiple increasing within the same row requires a garter bar to move the stitches quickly and easily.

2. Shaping vertical darts in which stitches are decreased or increased somewhere in the middle of the work. In such a case many stitches must be moved toward the center to fill in the empty space created by decreasing for darts, or moved toward the edge of the work to create empty space in the center of the work.

3. Removing the entire work from the machine and rehanging it on the machine with the reverse side facing you. This technique of reversing will be used most often in the following:

   a. In order to knit the next row in purl stitch rather than knit stitch or vice versa. Reversing the work every row gives the garter stitch effect.

   b. Reversing the work to place 2 right sides together for joining.

4. Removing the work from the machine temporarily instead of removing it on waste yarn and then rehanging.

The garter bars can be purchased individually or by the set. The set comes in a box and consists of:

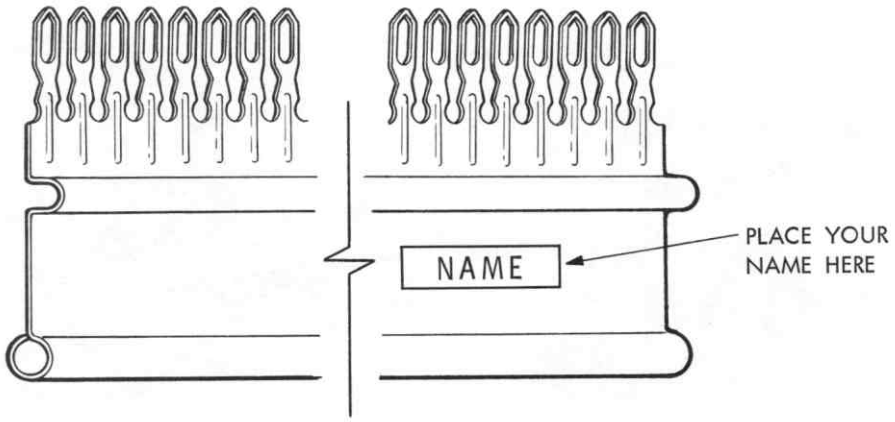
2 long garter bars (100 sts. each)
1 short garter bar (49 sts.)
2 needle stoppers (100 sts. each)

And these come with or without a small plastic bar with a foam rubber cushion and 2 clothes pins made of plastic. One of the long garter bars has a guide pin and a connector on the end. When connected with the short garter bar, it can accommodate up to 149 sts. and 200 sts. if connected to another long one. Thus, you can work with any size up to 49 or 100 sts. with a single garter bar and up to 149 with a combination of a long one and a short one. Working with more than 150 sts. you must connect 2 long ones.

Take a look at the garter bar. For easy handling, hold the short one in your hand. Note that there are 49 teeth with eyes and grooves below in the stem area. On the bottom or lower edge of the garter bar, the metal plate is

turned up in order to give a round edge. Feel it with your thumb. Right above this rounded lower edge is a 5/8" wide metal plate which is flat and straight.

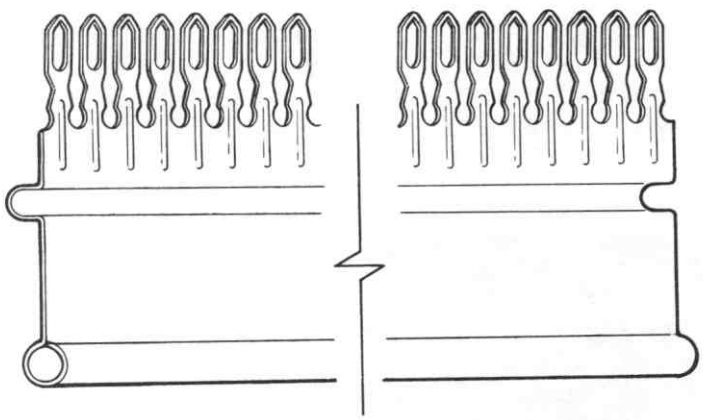
Between this 5/8" flat metal plate and the teeth with eyes on the tops and needle grooves on the stems, there is a big bump where this metal plate is bent. You will find the large groove on the opposite side of the bump you felt.



RIGHT SIDE UP

Since the garter bar looks almost the same from either side, the right side can only be distinguished by the needle grooves or the bump on it. Hold it with your index finger under the large groove (on the wrong side) and your thumb on the bump. Get acquainted with the right and wrong side by the touch of your own hand.

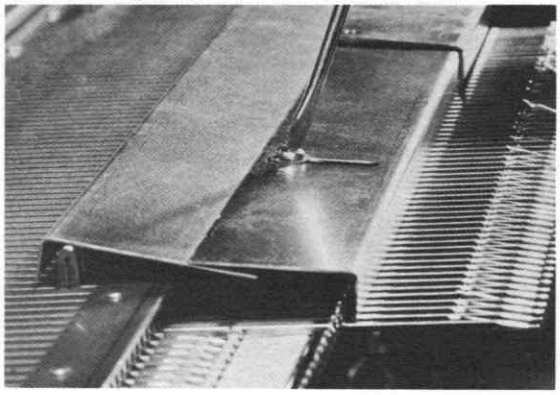
As an additional security measure, place your name on the right side of the 5/8" flat metal plate. This enables you to identify it and the right side of the garter bar at the same time. This will become a valuable asset in future samples.

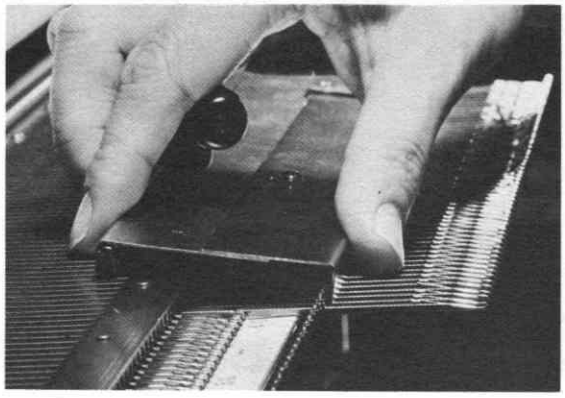


WRONG SIDE

The needle stoppers are used to hold the needles in position while working with the garter bar. They come in lengths of 100 sts. and adjustable widths to fit your machine. They can also be connected to cover the full length of the needle bed in order to accomodate more than 100 sts.

Pull out 50 or 60 needles to H.P. and place a stopper over the butts of these needles and the sinker posts. The width of the stopper should be wide enough so the needle butts and the sinker posts fit snugly under it. If it is too tight or too loose to keep the needles in place the width should be adjusted. Loosen the screws on the stopper, adjust the width to fit your machine, then tighten the screws.



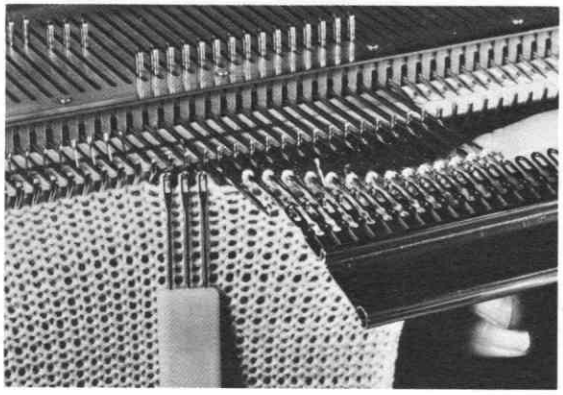


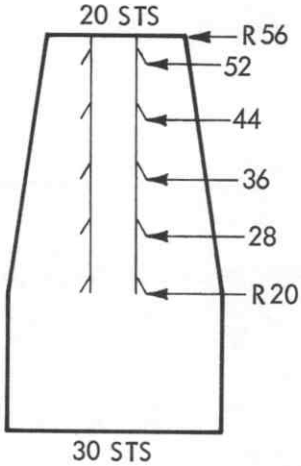
SAMPLE NO. 60 -- Vertical Darts--Decreasing 1 Stitch at a Time

1. Cast on 30 sts. with any method and knit 20 rows. Mark the 8th needle on both sides of the center.

2. Transfer the stitch on the needle #8 to #7 and move all the stitches outside of the marked needle #8, which is vacant now, toward the center to fill in the vacant 8th needle as follows:

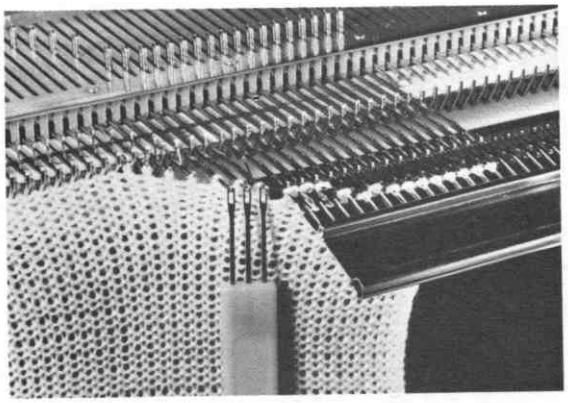
   a. Work on one side first. Pull out to H.P. all the needles that are outside of the vacant needle (#8). Hang the 3 pronged transfer tool on the needles #5, #6, and #7 to keep the stitches from dropping. (Claw weights remain hanging on the work throughout this operation.)





b. Hold the garter bar in your hand and ascertain that your name and the bump are up, which means the right side is up.

c. Place the garter bar on the hooks of the needles in H.P. Pull the work forward until the stitches slide onto the garter bar.



d. Before lifting the garter bar from the hooks of the needles, slide the garter bar slightly backward until the eyes of the garter bar teeth open the latches. When they open and lie flat on the stems of the needles, lift the garter bar and move over 1 place toward the center.

e. Place the garter bar securely on the needles #9 through the end of the work, leaving 1 empty needle on the end. Check to see if all the eyes are hooked onto the needles.

NOTE: Any eye that is not hooked onto the corresponding needles means a dropped stitch.

f. Slide the stitches back to the needles. Do not push the stitches behind the latches. Push those holding needles back into W.P. with the lower edge of the garter bar on the needle butts.

g. Remove the 3 pronged transfer tool from the needles.

h. Do the same for the other side.

3. Knit 8 rows and repeat the procedure in Step 2 above. (The dart line remains a straight line.)

4. Repeat the above 3 more times. 20 sts. remain.

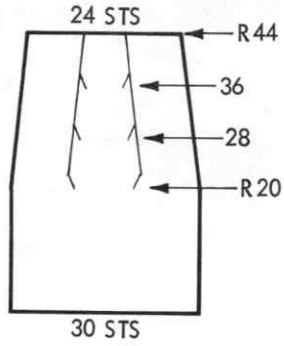
5. Knit 4 more rows and bind off on row 56.

SAMPLE NO. 61 -- Vertical Darts--Decreasing 1 Stitch at a Time (Another Method)

1. Cast on 30 sts. with any method and knit 20 rows.

2. Transfer the stitch on the needle #9 to #10, and transfer those 2 sts. from #10 to #9. Now #10 is vacant. Do the same for the other side.

3. Move all the stitches outside of #10 toward the center to fill in the vacant needle #10. Push to "A" position the needle #15 which became vacant.



4. Do the same for the other side and knit 8 rows.

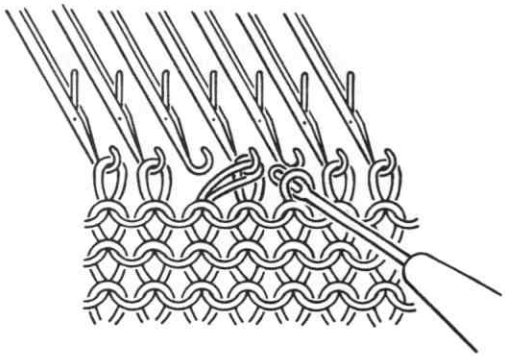
5. Repeat the same procedure in Steps 2 through 4 except you work on needles #8 and #9. The dart line is moving toward the center by 1 place every time you decrease.

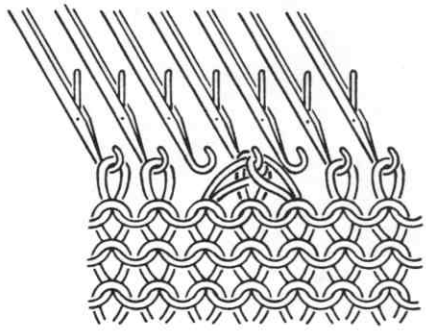
6. Repeat the same procedure as in Steps 2 through 4 working with the needles #7 and #8. Knit 8 rows and bind off.

SAMPLE NO. 62 -- Vertical Darts--Decreasing 2 Stitches at a Time

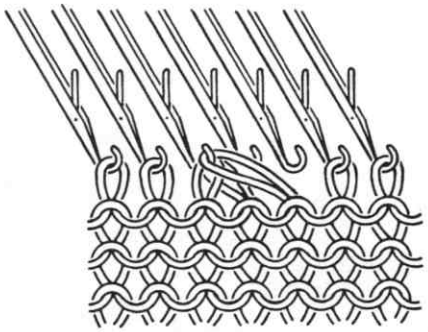
1. Cast on 30 sts. with any method and knit 20 rows.

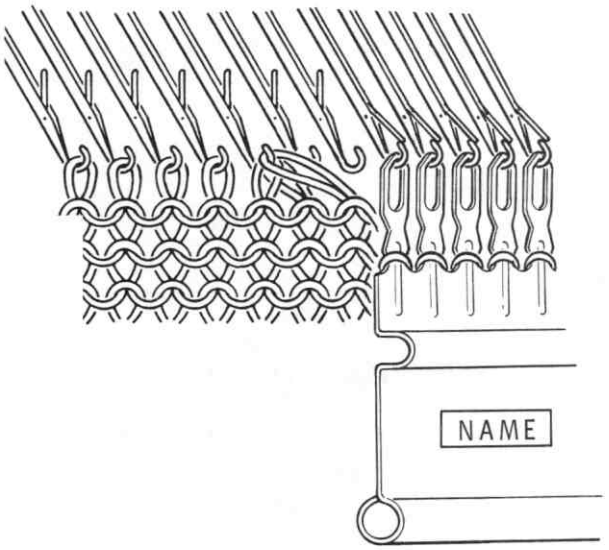
2. Counting from the center, transfer the stitch on #6 to #7 and also the stitch on #8 to #7. This will leave the needles #6 and #8 vacant and 3 sts. on #7.





3. Transfer all 3 sts. on #7 to #6, leaving the needles #7 and #8 vacant.

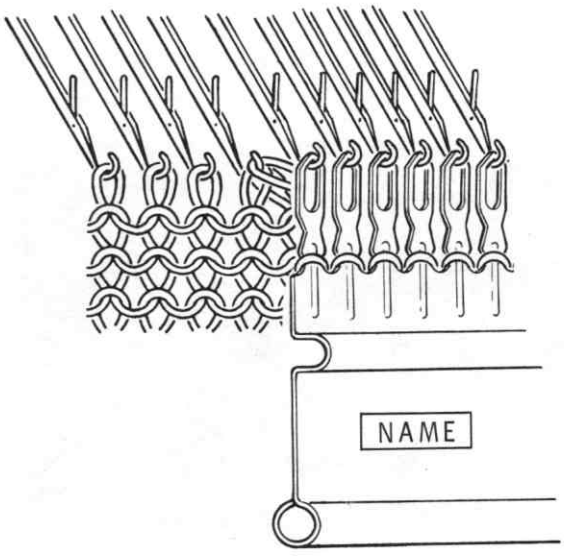


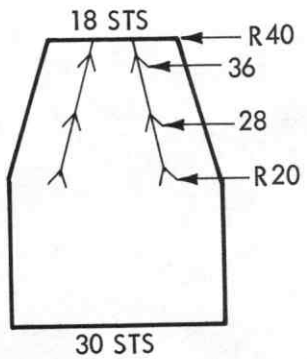


4. Move all the stitches outside of the 2 vacant needles toward the center to fill the vacant needles. Push into "A" position needles #14 and #15 which became vacant.

5. Do the same on the other side.

6. Knit 8 rows and repeat the same procedure, except the needles to work on this time will be #5, #6, and #7. The reason is that the center needle which has 3 sts. on it was moved by 1 place toward the center. The needles #12 and #13 will go out of work after making the decreases. Do the same for the other side.





7. Knit 8 rows and repeat the same procedure with needles #4, #5, and #6. Do the same for the other side. The dart line moves in 1 stitch with each decrease.

8. Knit 4 rows and bind off.

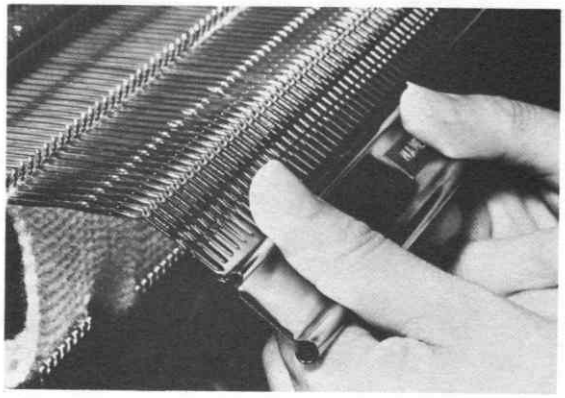
SAMPLE NO. 63 -- Reversing and Garter Stitch

1. Cast on 45 sts. with "e" cast on and knit 16 rows.

2. Reverse the work using the garter bar as follows:

   a. Pull out all the needles to H.P. Place the needle stopper to keep the needles in place. The teeth of the stopper must be placed behind the stitches.

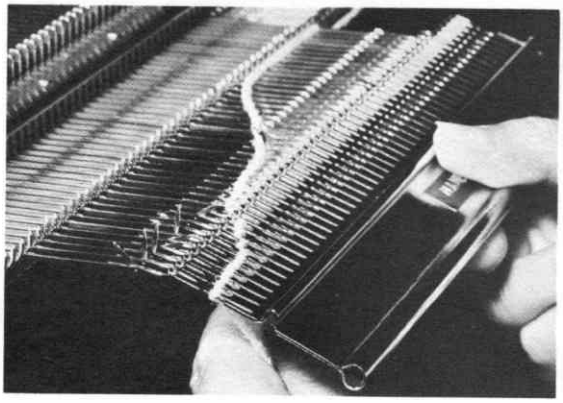
   b. Hold the garter bar and make sure that your name and the bump are under your thumb, and you can feel the large groove with your index finger on the underside.

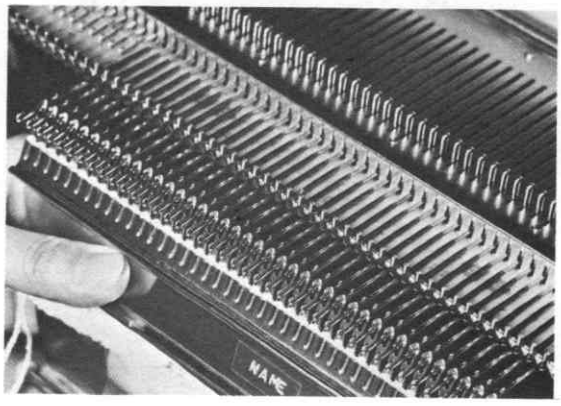


   c. Slide the stitches onto the garter bar. Push the latches open before lifting the garter bar.

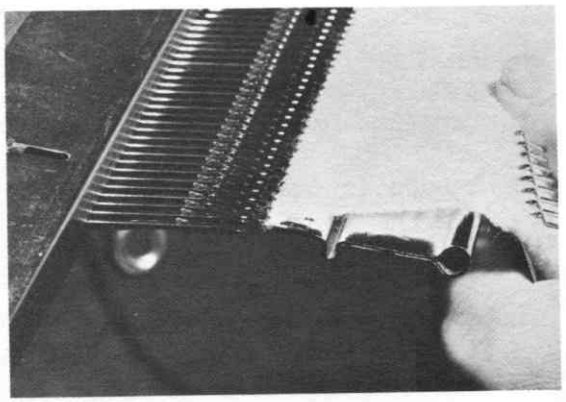
   d. Line up the stitches on the garter bar and make sure the stitches are close to the base of the stem of each tooth.

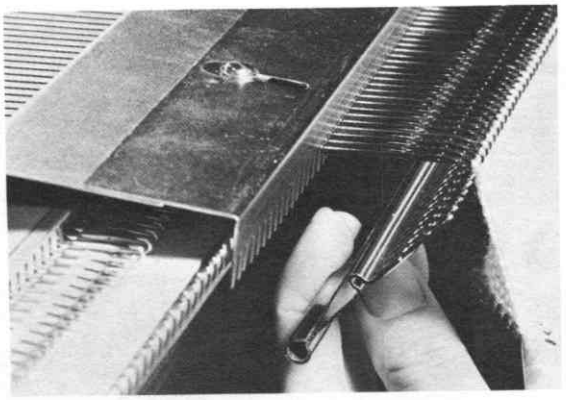
   e. Reverse the garter bar, with the work still hanging on it. Notice that your name is now on the underside and the large groove is on the top.





f. Place the garter bar back on the needles. However, DO NOT hook the eyes of the garter bar teeth onto the needles. Place it flat on the hooks of the needles, lining up the tip of the garter bar teeth to the tip of the opened latches. When it is placed correctly, the hooks of the needles are under the grooves of the garter bar and hooked onto the stitches.





g. Gently try to move the garter bar slightly toward you. If it moves readily, then the stitches are not hooked on the needles properly. If it hugs and does not move readily, the stitches are caught by the hooks of the needles.

h. Tilt the base of the garter bar gently under the needles, away from you, in order to see if all the stitches are caught by the hooks. If there are stitches not hooked onto the needle, lift the garter bar gently and repeat the procedure in steps f through h.

i. Tilt the base of the garter bar gently under and away from you as you did in Step h. Pull the garter bar down and away from you. The garter bar will slip down and the stitches remain on the needles.

NOTE: If you pulled the garter bar toward you, the eyes of the garter bar will hook onto the needles and you will have a mess!

j. Remove the needle stopper from the needle bed. Push the needles back into W.P. by pushing the needle butts with the lower edge of the garter bar.

3. Set the cam lever for free pass (slipping) to R and knit to L. _____

_____ Slip the cam to R and knit back to L.

4. Reverse the work again. (Steps 2a through j.)

5. Slip the cam to R and knit back to L.

6. Repeat Steps 4 and 5 above until R.C. reads 041.

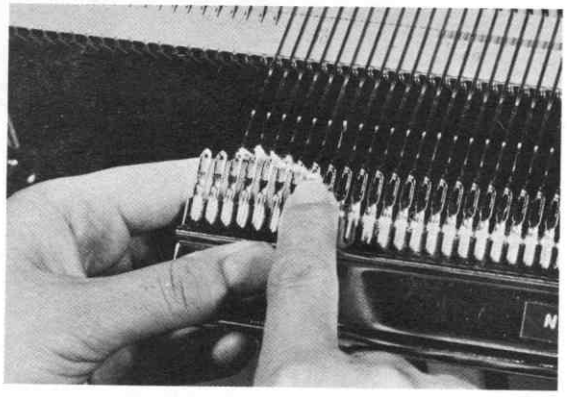
7. Remove the work on waste yarn.

SAMPLE NO. 64 -- Multiple Decreasing

1. Cast on 45 sts. with any method and knit 30 rows. Cam at R.

2. Transfer all the stitches to ghe garter bar.

3. Slip 1st and 2nd stitches on the left edge to the corresponding needles with your finger.

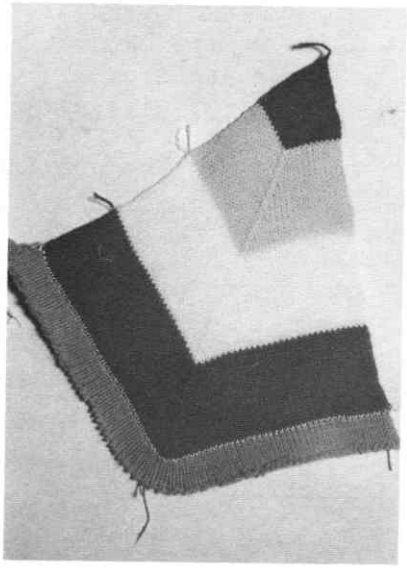


4. Lift the garter bar carefully, move over 1 place to the left and slip next 3 sts. to the corresponding needles. (The 2nd needle has 2 sts. on it.)

5. Repeat Step 4 until all the sts. have been placed back on the needles. (30 needles in working and every other needle has 2 sts.)

6. Knit 20 rows and bind off.

SAMPLE NO. 65 -- Triangle--Use of Garter Bar



1. Cast on 81 sts. and knit several rows with waste yarn. Knit 1 row with ravel cord and change to main yarn.

2. With main yarn, knit 2 rows and mark the center stitch.

3. Decrease 1 stitch each side of the center stitch as follows:

   a. Transfer the next stitch to the center stitch to the center stitch (on both sides) and end with 3 sts. on 1 needle.

   b. Transfer this center stitch with 2 added sts. to either one of the empty needles. (Now there are 2 empty needles together.)

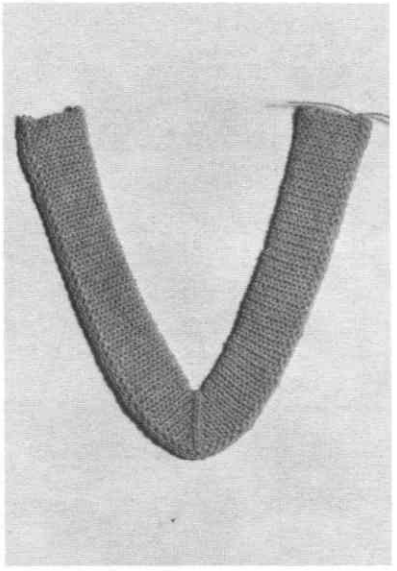
c. Transfer all the stitches on the outside of the 2 empty needles over by 2 places to fill the empty needles.

4. Knit 2 rows and decrease 2 sts. again. Move one side of the work by 2 places. The center stitch is moving to one side every time you stop and decrease.

5. Repeat the above 3 more times. (Row 10) Five decreases have been made.

6. Repeat the above procedure until there is 1 stitch left. Change color every 20 rows.

SAMPLE NO. 66 -- V-Neck Band

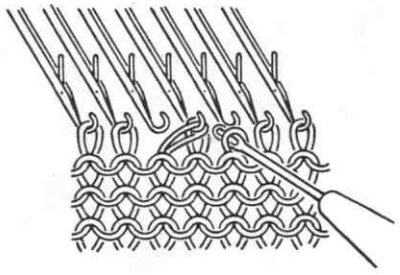


1. Cast on 81 sts. with waste yarn and knit 10 to 12 rows. Change to ravel cord and knit 1 row.

2. Change to main yarn and turn the row counter to 000.

3. Knit 2 rows and place a marker on the center stitch. (Row 2)

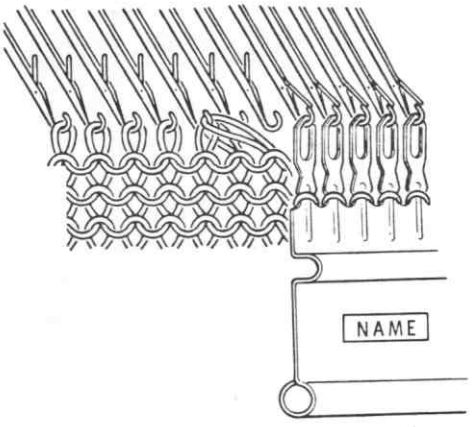
4. Decrease 1 stitch on each side of the center stitch as in Sample No. 65 ending with 3 sts. on the center needle.



5. Move one half of the work toward the center with a garter bar to fill in the empty needles.

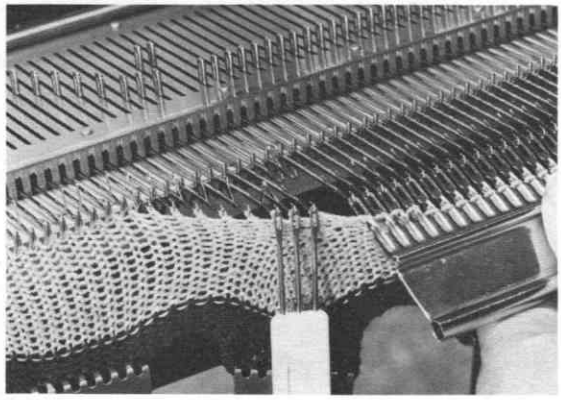
6. Knit 2 rows and decrease 1 stitch on each side of the center stitch. Notice the center stitch is moving as you decrease.

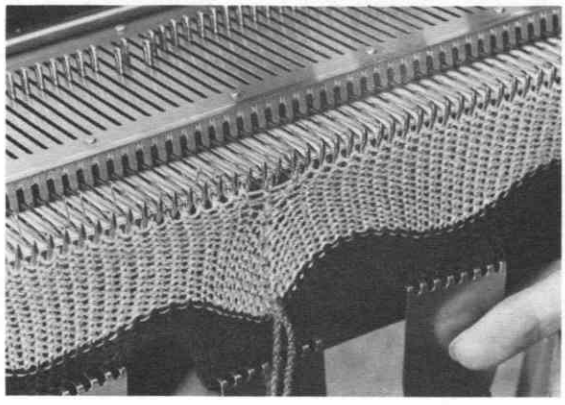
7. Move half of the work to fill in the empty space created.



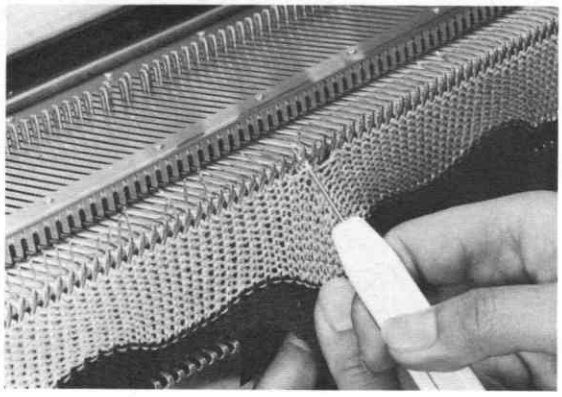
8. Repeat steps 6 and 7 above until you have decreased 5 sts. on each side of the center stitch. Decreasing rows: 2, 4, 6, 8 and 10.

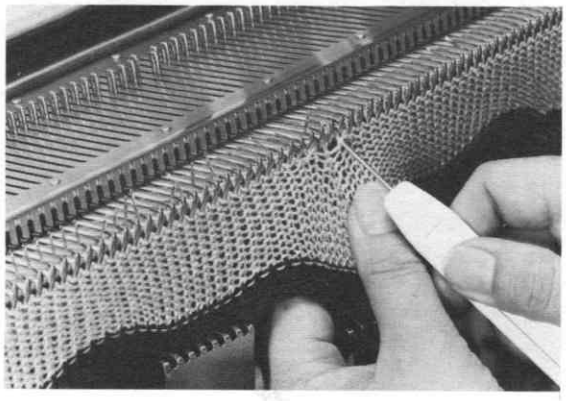
9. Underside of V-neck band: Knit 2 rows. (Row 12) With a garter bar, move back one half of the work toward outside of the work by 2 places. There are 2 empty spaces created in the center of the work.





10. Transfer the center stitch to make 1 empty needle on each side of the center stitch. Increase 1 stitch on each side to fill in those empty spaces by picking up the loop below the adjacent stitch as in the case of a full fashion increase.

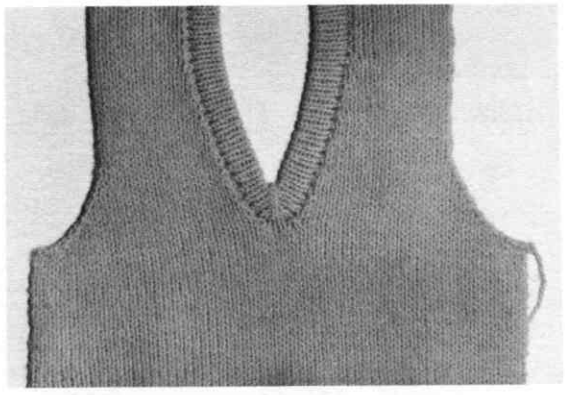




11. Repeat the procedure described above in Steps 9 and 10 until you have increased 5 sts. on each side. Increasing rows: 12, 14, 16, 18, and 20.

12. Knit 2 rows and pick up beginning edge of this band. Knit 1 row and bind off with any method. Remove the ravel cord.

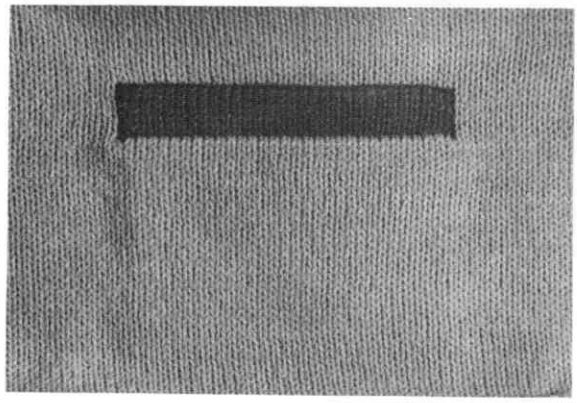
SAMPLE NO. 67 -- Neck Band on V-Neck Front



1. Make a sample exactly the same as Sample No. 43.
2. Hang the neckline by picking up every other row (every loop) and the center stitch from one shoulder seam to the other.
3. Knit 2 rows, decrease 1 stitch on each side of the center stitch and move one half of the work to fill in.
4. Repeat the above 3 more times.
5. Knit 2 rows (Row 10) and move one half of the work toward outside of the work. Increase 1 stitch on each side of the center stitch.
6. Repeat the above 3 more times (by increasing on rows 12, 14, and 16).
7. Knit 1 more row and remove on waste yarn. Whip down the band.

CHAPTER 11 POCKETS AND BUTTONHOLES

SAMPLE NO. 68 -- Pocket with Welt



1. Cast on 60 sts. and knit 40 rows. End the cam at R.
2. Place a marker on the sinker loop between needles #15 and #16 (a bar between sts. on these needles) on each side to mark off 30 sts. in the center for the pocket.
3. Remove the entire work on waste yarn in 3 sections, and hang back those 30 sts. marked for the pocket.
4. Reset the row counter to 000 and turn the tension dial to 1 whole number lower. Knit 16 rows with a contrasting color and cut the yarn.
5. Pick up and hang the same 30 sts. that you had picked up in Step 4 above on the same needles. (2 sts. on each needle.)
6. Turn the row counter to 000, and set the tension dial back to the main tension. Change yarn to main color (garment yarn) and knit 60 rows. End the cam at R.
7. Pick up the 15 sts. on the left side of the pocket and rehang them on the machine. Remove the waste yarn from this portion of the work only.
8. Reset the row counter to 40 and knit 1 row. (Cam at L.) Pick up the 15 sts. on the other side of the pocket and rehang them on the machine.
9. Remove the waste yarn and knit 1 row. The row counter shows 42. This completes the knitting of the pocket. Knit 20 more rows and bind off.
10. Whip the sides of the pocket and tack down the welt.

SAMPLE NO. 69 -- Pocket with Ribbed or Garter Stitch Welt

1. Cast on 60 sts. and knit 40 rows. End the cam at R.

2. Place a marker on each side of the pocket as in Sample No. 68. The pocket will be 30 sts. in the center.

3. Remove the entire work on waste yarn in 3 sections.

4. With another piece of scrap yarn, cast on 30 sts. for the pocket. Knit 8 to 10 rows and change to ravel cord. Knit 1 row with ravel cord. With main yarn, knit 60 rows for the pocket.

5. Pick up from the main garment piece 15 sts. on the left side of the pocket. Remove the w.y. from this section. Reset the row counter to 40 and knit 1 row.

6. Pick up the other 15 sts. on the right side of the pocket. Remove the w.y. and knit 1 row. The row counter is 42 now.

7. Knit 20 rows and bind off. Remove from the machine.

8. Pick up the 30 sts. for the pocket from Step 3 with purl side facing you.

9. Hang the 30 sts. from the open end of the pocket over the stitches of Step 8. (There are 2 sts. on all 30 needles.)

10. Knit with ribbing or garter stitch to make welt. Bind off and remove from the machine.

SAMPLE NO. 70 -- Eyelet Buttonholes

1. Cast on 15 sts. and knit in K1 P1 ribbing for 8 rows.

2. After reversing every other stitch to purl, transfer the center stitch (8th from the edge) to the next stitch on the right side (7th from the edge) as in eyelet. (Leave empty needle in W.P.)

3. Knit 8 more rows in K1 P1 ribbing. Reverse every other stitch for purl.

4. Transfer the center stitch to the adjacent needle on right, as in Step 2.

5. Knit 4 more rows in K1 P1 (row 20) and change to stockinet.

6. Knit 10 rows (row 030) and transfer the center stitch to the next on right.

7. Knit 10 more rows (row 040) and make another eyelet buttonhole.

8. Knit 8 more rows (row 048) and set the cam for garter stitch (slipping or free pass to L and knitting to R): _____

9. Knit in garter stitch 6 rows (R.C. advances 12 to row 060) and make an eyelet buttonhole in the same position.

10. Knit 10 more rows in garter (row 080) and make an eyelet buttonhole in the same position.

11. Knit 4 more rows in garter stitch (row 088) and bind off.

SAMPLE NO. 71 -- Large Eyelet Buttonholes

1. Cast on 16 sts. with chain cast on and knit 10 rows. Cam at R.

2. With a transfer tool, transfer 2 center stitches to the adjacent needle on each side. Push these empty needles out of work to "A" position.

3. Knit across 1 row. (Cam at L.) With a transfer tool, pick up the loop formed over the empty needles and hang on one of the 2 empty needles and bring it out to W.P.

4. Knit 1 more row. (Cam at R.) Pick up the loop made on the last cam move and hang it on the other empty needle. This brings this needle into W.P.

5. Knit 8 more rows (R. 20) and make another large eyelet buttonhole as described in Steps 2 through 4.

6. Knit 8 rows (row 28) and change the cam setting to garter knitting.

7. Knit in garter stitch 5 rows (R.C. 038) and make another large eyelet buttonhole.

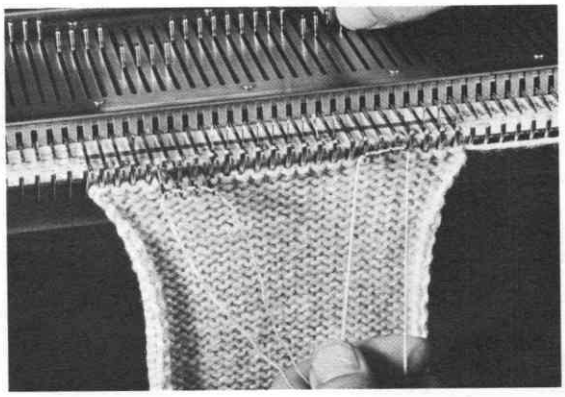
8. Knit in garter stitch until R.C. reads 058. Make one more large eyelet buttonhole and knit 5 more rows in garter stitch. (R.C. 068) Bind off.

9. Finish the buttonhole with buttonhole stitch using a contrasting yarn and tapestry needle.

SAMPLE NO. 72 -- Woven Buttonholes

Material required: 4 ply yarn
ravel cord
large tapestry needle with c.c. yarn

1. Cast on 25 sts. and knit 10 rows. Pull out the needles #5, #6, #7 and #8 from both sides of the work to H.P. Take a piece of ravel cord and hand knit over those needles.

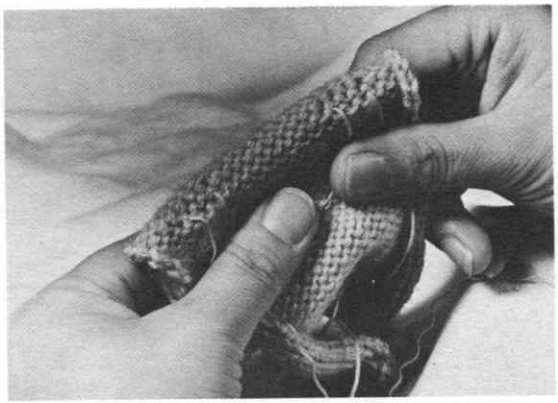


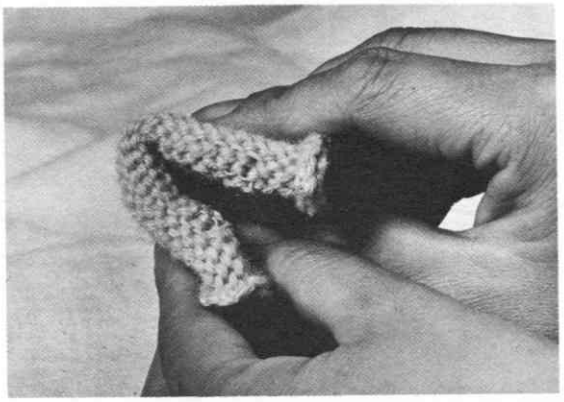
2. Knit 30 rows and pull out the same needles #5 through #8 to H.P. Hand knit these stitches with ravel cord. Repeat this procedure as many times as necessary. For practice, make at least 4 to 5 buttonholes.

3. Knit 10 rows after the last buttonhole. Bind off and remove from the machine.

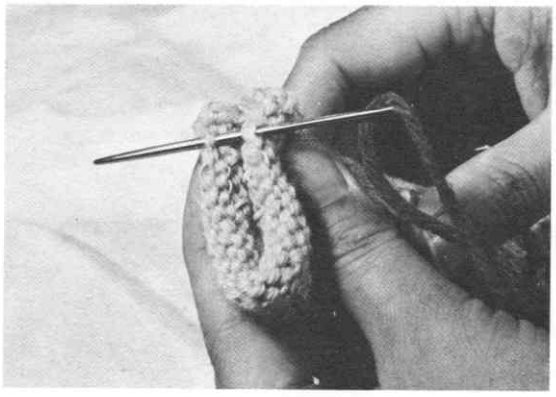
4. Hand finish the buttonholes as follows:

   a. Hold the work with purl side facing you. Fold it at the buttonhole row. Fold lengthwise to bring both sets of ravel cord knitting together.





b. Weave the outside loops in front and those in the back using the Kitchener stitch. Do not weave the 2 edges on inside.

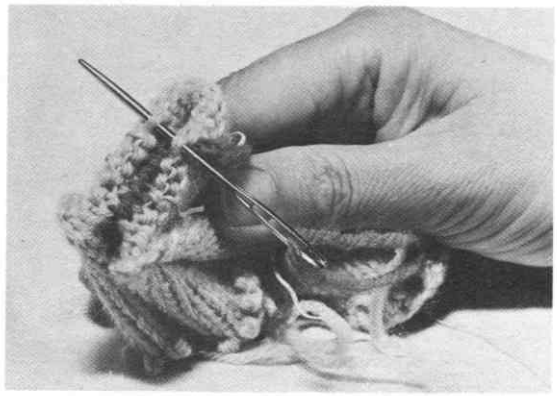


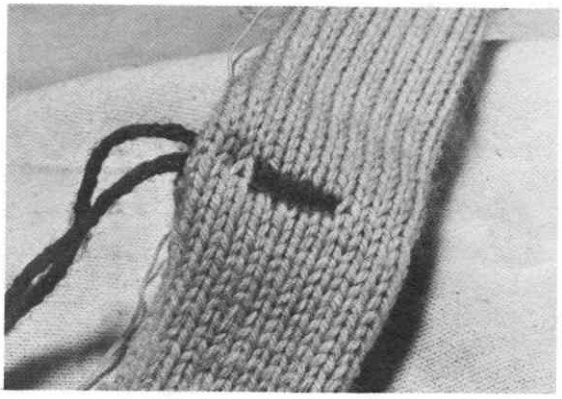
c. When the 2 outside edges of the buttonhole are woven, turn the work around to show the former inside edges on the outside.

d. Weave the 2 outside edges with Kitchener stitch. Tie a square knot.

e. Remove the waste yarn.

5. Do the same for the rest of the buttonholes.





Chapter 12 Seaming and Joining

No matter how well you knit on the machine or by hand, seaming can make or break the garment. Consider the well-made garments of fabric. What makes the garment? Certainly, the quality and the kind of fabric, the color and the texture of the fabric are all important factors. However, the seams and stitches done on the sewing machine or by hand play a more important part in the way the garment looks. If the stitches are uneven and pulling, or the seams are crooked where they should be straight, the garment is ruined, no matter how good the material may be.

The same thing is true with knitted garments. In sewing, the fabric is already made by the manufacturer. You lay it out on a table and cut the material according to the pattern. Then you start sewing. So, the real work in sewing begins with cutting, the sewing comes next. And sewing is really stitching up the seams, by hand or on sewing machine.

In knitting, you knit the fabric to the shape and size desired. During this process you are also involved in the designing of the fabric, its color, texture and pattern stitches. While doing all of this you are so involved with the charting and the knitting part of the work, you tend to feel the biggest job is done when the pieces are knitted and removed from the machine. True, the biggest job may be done, but the most important of the process is yet to be accomplished. That is, seaming and finishing, which is the actual construction of the garment. It is very important for you to learn and master good techniques in seaming and finishing.

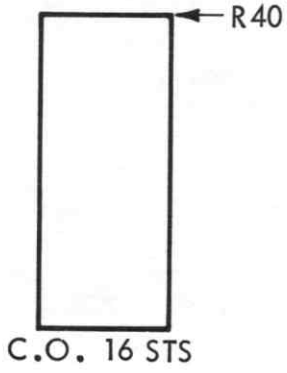
In this day and age when we are blessed with many modern conveniences, including knitting machines and sewing machines, there is no reason why we could not use the sewing machine to finish the knitted garments. There are many accomplished seamstresses who can handle knitted materials expertly. If it is done properly, it is much better than seaming done poorly by hand.

However, all knitters should know how to do hand seaming since there is bound to be a time when you must do some hand work. Since experience is the best teacher of all, you are going to make a sample of each method. Use different color yarn for each sample or attach a sticker or a tag with an identifying number for future reference.

SAMPLE NO. 73 -- Weaving or Invisible Stitches

Material required: 4 ply orlon yarn 2 colors
scrap yarn
large tapestry needle

1. Cast on 16 sts. on E/O/N with chain c.o. and knit 40 rows.

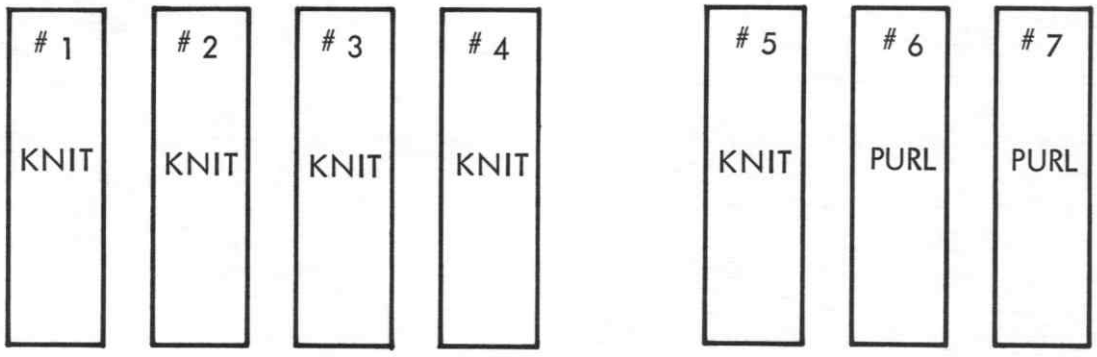


2. Bind off using any binding method. Stretch the work lengthwise immediately after removing from the machine.

3. Make 6 more of the same color and block them.

4. You will seam 4 pieces into 1 piece, using 3 different methods. Using 2 more methods seam the last 3 pieces.

   Altogether, you will use 5 different methods.



a. <u>One Stitch Seam with 1-Bar Pick up</u>:

1) Take the 1st and 2nd piece and line them side by side with the knit sides up.

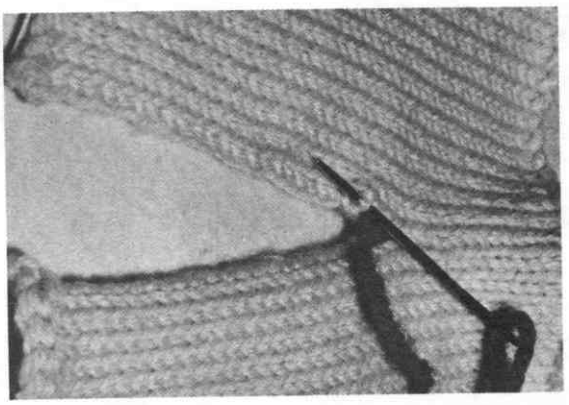
2) Insert the tapestry needle in the ridge between the 1st and 2nd stitch from the edge of the piece No. 1.

3) Pick up 1 bar and pull the yarn. Insert the needle in the ridge between the edge stitch and the next stitch of the piece No. 2.

4) Pick up 1 bar and go to the 1st piece and pick up the next bar in the same ridge. Pull the yarn snug.

5) Insert the needle in the same ridge and pick up the next bar.

6) Continue in the same manner and stretch the seam after every 5 or 6 rows. Seam the entire length in this manner.



b. <u>One Stitch Seam with 2-Bar Pick up</u>:

1) Line up the 3rd piece next to the 2nd piece which is already seamed to the 1st piece. Knit side up.

2) Insert the tapestry needle into the ridge between the edge stitch and the next stitch and pick up 2 bars. Pull the yarn.

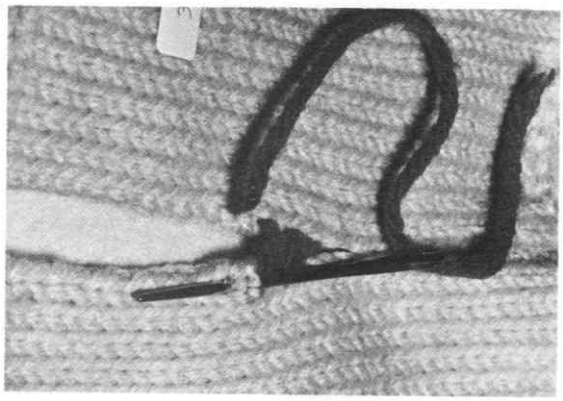
3) Insert the needle in the ridge between the 1st and the 2nd stitch from the edge of the other piece.

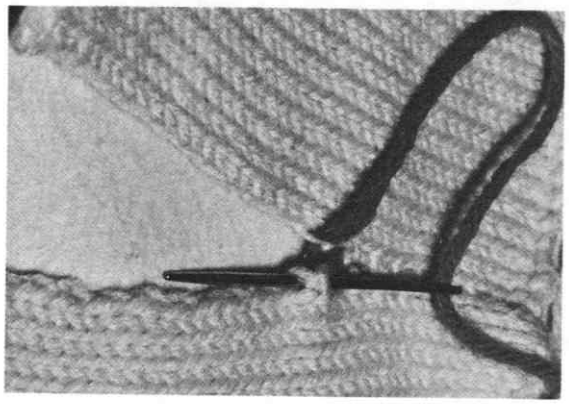
4) Pick up 2 bars and pull the yarn.

5) Insert the needle back into the very place it came out from on the previous turn (in Step 2 above) and pick up 2 bars.

6) Go across to the other piece and insert the needle back into the same spot that the needle came out from on the previous turn (in Steps 3 and 4 above) and pick up 2 bars.

7) Repeat the above 2 steps. Stretch the seam line after every 5 or 6 rows. Continue in this manner until the entire length is seamed.





c. Half Stitch Seam with 2-Bar Pick up:

1) Line up the 4th piece with the 3rd. Knit side up.

2) Look at the edge stitch closely. You will notice a long stitch (loop) and a very short stitch (knot) alternate every other row.

3) Insert the tapestry needle into the 1st loop of the piece No. 4 and pick up the knot and come out of the next loop. This is the same as picking up 2 bars.

4) Go to the piece No. 3 and insert the needle into the 1st loop and pick up a knot. Come out of the next loop.

5) Insert the needle back into the old loop on the piece No. 4 and pick up a knot. Come out of the next loop.

6) Return to the old loop of the piece No. 3, pick up a knot and come out of the next loop.

7) Repeat the above 2 steps always going into the old loop, picking up a knot and coming out of the next loop.

8) Remember to stretch the seam every 5 or 6 rows.

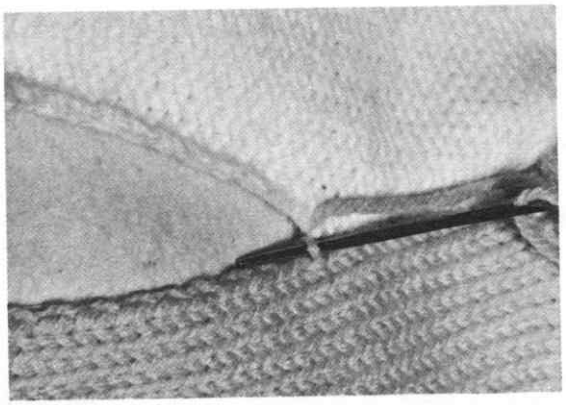
d. Half Stitch Seam with 1-Bar Pick up--Knit Side and Purl Side

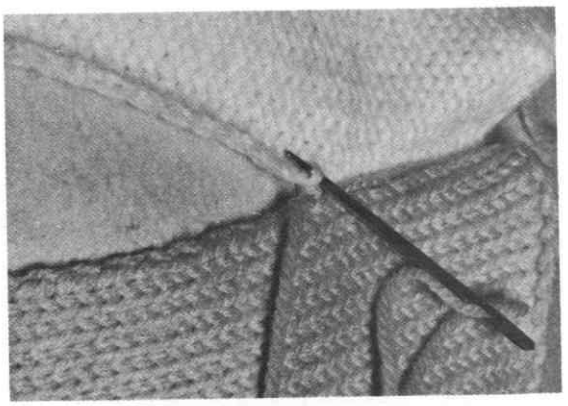
1) Take the piece No. 5 and place it with knit side up. Place the piece No. 6 right next to it with the purl side up.

2) Insert the needle into the center of the edge stitch of the knit side. Pick up 1 bar and pull the yarn.

3) Go to the purl side and insert the needle into the center of the edge stitch and pick up 1 bar. Pull the yarn.

4) Repeat the above 2 steps. Stretch the seam line after every 3 or 4 rows in order to prevent the seam from getting too tight. Continue until you seam the entire length.





e. Half Stitch Seam with 1-Bar Pick up--Purl to Purl

1) Line up the last piece next to the piece No. 6 to seam purl side to purl side.

2) Insert the tapestry needle into the center of the edge stitch of the piece No. 6 and pick up 1 bar. Pull the yarn to close the seam.

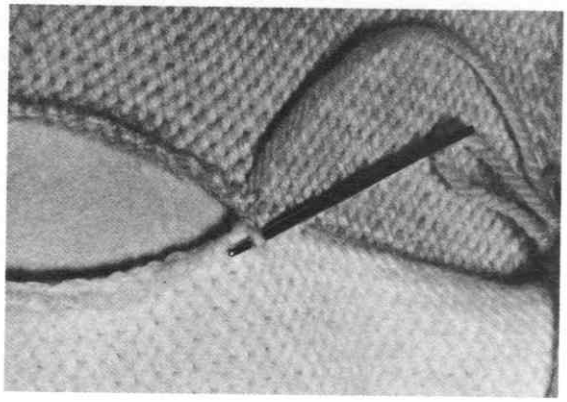
3) Go to the piece No. 7 and pick up the 1st sinker loop from the edge. Pull the yarn and close the seam.

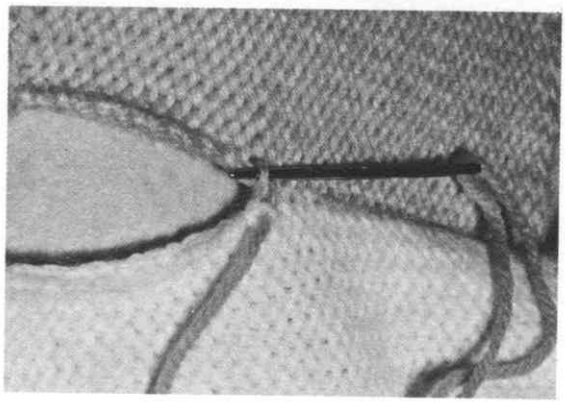
4) Go back to the piece No. 6 and insert the needle into the center of the edge stitch and pick up the next bar which is the next row. Pull the yarn.

NOTE: If it is difficult to pick up a bar from a knot, insert the needle in the knot and wiggle a little to loosen the knot. Then you will be able to see the bar going across the edge stitch.

5) Go back to the piece No. 7 and pick up the next bar which is the sinker post loop right above the one picked up on the previous turn. Pull the yarn.

6) Repeat the above 2 steps. Stretch the seam line after every 3 or 4 rows to prevent the seam from pulling too tight. Continue in this manner until the entire seam is closed.

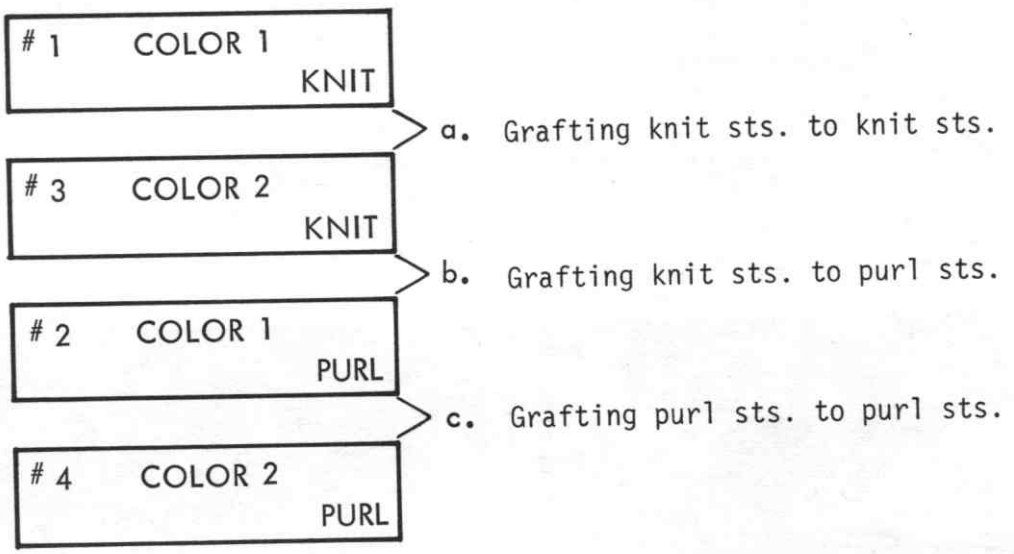




SAMPLE NO. 74 -- Grafting with Kitchener Stitch

Material required: 2 colors of 4 ply yarn
scrap yarn
large tapestry needle with 3rd color

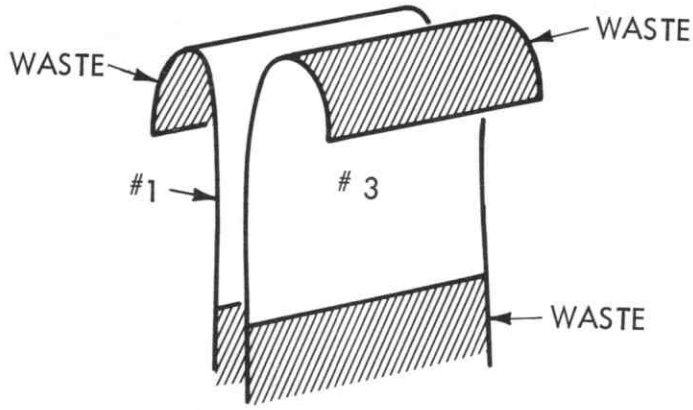
1. Cast on 30 sts. on E/O/N and knit 9 rows with waste yarn. Tension 8.0.
2. Change to ravel cord and knit 1 row only.
3. With color no. 1, knit 20 rows and remove on waste yarn.
4. Make another piece just like it in the same color.
5. Make 2 more pieces in color no. 2 using the same no. of stitches and rows.
6. Stretch lengthwise and block all 4 pieces.
7. Arrange them as shown below:


1 COLOR 1 KNIT
3 COLOR 2 KNIT
2 COLOR 1 PURL
4 COLOR 2 PURL
a. Grafting knit sts. to knit sts.
b. Grafting knit sts. to purl sts.
c. Grafting purl sts. to purl sts.

a. Grafting Knit Stitches to Knit Stitches with Kitchener Stitch

1) Hold piece #1 upside down with the purl side facing you with the waste knitting and 1 row ravel cord at the top.

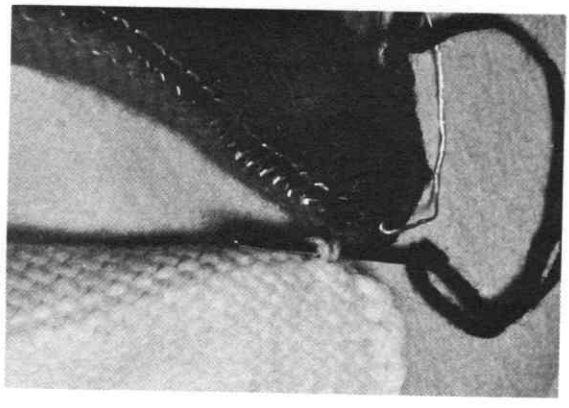
2) Fold the waste knitting to the back (toward the knit side).

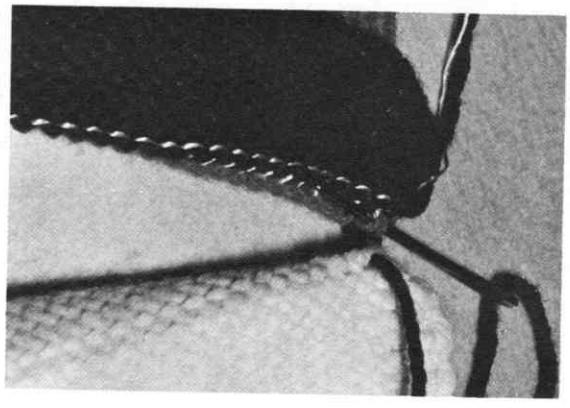


3) Take piece #3 and hold it right side up with the knit side facing you.

4) Fold the waste knitting at the top toward you and place this piece on piece #1 so they will be together back to back. Now you have 2 purl sides together.

5) Using the 3rd color, insert the needle into the 1st stitch of the front piece (#3) from the back to the front.





6) Pull the needle through the stitch and hold down the end of the joining yarn with your left thumb.

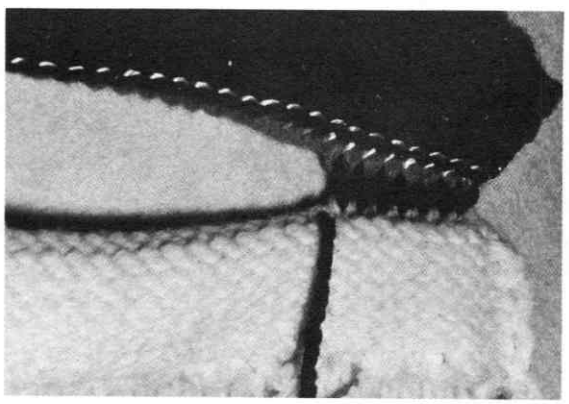
7) Insert the needle into the edge stitch of the back piece (#1) from the purl side to the knit side (away from you). Pull through.

8) Insert the needle into the 1st stitch (old stitch) of the front piece (#3) from the knit side to the purl side (front to back) and out through the next stitch from the purl to knit (back to front).

   At this point these 2 sts. on the needle form a letter v (right side up). Pull through.

9) Insert the needle into the 1st stitch of the back piece from the knit side to purl side, and out from the next (new) stitch from the purl side to the knit side.

   At this point these 2 sts. form an upside down v.



10) Go back into the previous stitch of the front piece, and come out of the new stitch, making a letter v.

11) Go into the previous stitch of the back piece and come out of the next new stitch from the front piece. (upside down v)

12) Repeat the above 2 steps until all the stitches are grafted.

b. Grafting Knit Stitches to Purl Stitches with Kitchener Stitch

1) Place piece #2 next to piece #3 with purl side showing as the right side.

2) Fold up the waste knitting at the bottom of piece #3 and fold down (to the back) the waste knitting at the top of piece #2.

3) Thread a 3rd color yarn to the tapestry needle.

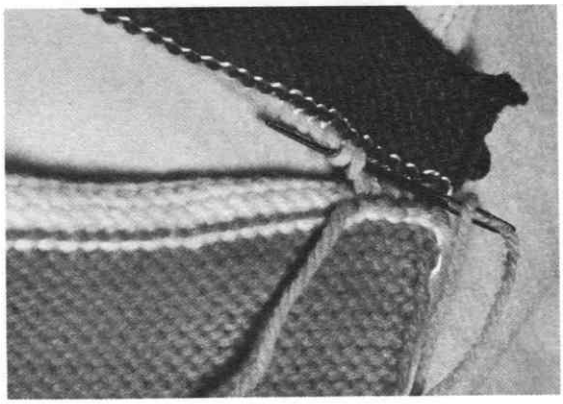
4) Insert the needle into the edge stitch of piece #2 from purl side to knit side (front to back) which is the opposite of the procedure in the last sample.

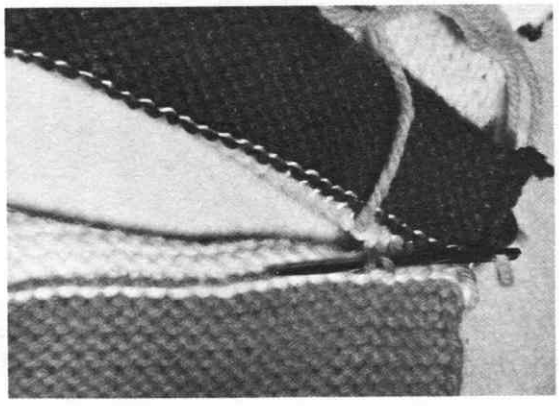
5) Insert the needle into the edge stitch of piece #3 from the right side (front to back) and bring out from the next stitch from back to front. This will be the same as inserting the needle into old and new (upside down v).

6) Insert the needle back into the old stitch (which is at the edge) of piece #2 from the back to front and into the next stitch from the front to back. (Again, these 2 sts. will be upside down v.)

7) Insert the needle into the old stitch of piece #3 from the front to back and out comes from the next stitch forming an upside down v on the needle.

8) Repeat the above 2 steps until all the stitches are joined.





c. Grafting Purl Stitches to Purl Stitches with Kitchener Stitch

1) Hold piece #2 right side up (#1 and #3 already joined) with purl side facing you and fold the waste knitting to the back.

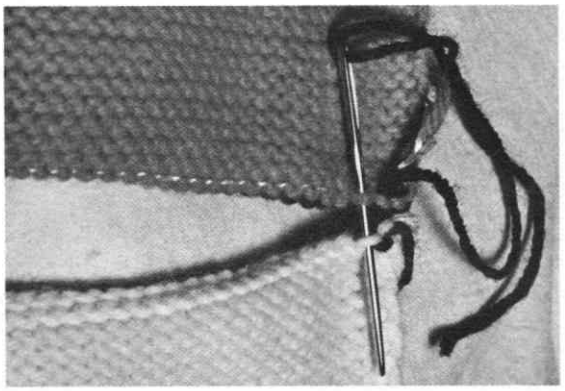
2) Hold piece #4 with the right side up with purl side facing you. Fold the waste knitting at the top to the back.

3) Hold the samples with the waste knitting sandwiched between pieces #2 and #4.

4) Insert the tapestry needle into the 1st stitch to the front piece (#4) from front to back and into the back piece (#2). Pull the yarn and firmly hold the end of the yarn with the left thumb.

5) Still holding the 2 pieces together, insert the needle into the next stitch of the back piece (#2) and across to the 1st (old) stitch of the front piece (#4). Pull through.

6) Insert the needle into the next (new) stitch of the front piece (#4) and across to the old stitch of the back piece (#2).



NOTE: Line up the front piece (#4) slightly to the left (about the width of ½ stitch) so that the tapestry needle could be inserted directly into the new and the old stitches straight across from each other.

7) Continue Steps 7 and 8 until all the stitches are grafted.

When all samples are grafted together, remove waste yarn and ravel cord and block lightly.

SAMPLE NO. 75 -- Joining with Slip Crochet Stitch

As the name indicates, you are making slip stitches with a crochet hook. It is a good method to use in areas where you want a seam line finished without give, such as armhole and sleeve caps, and other curves where you don't want them to stretch and sag.

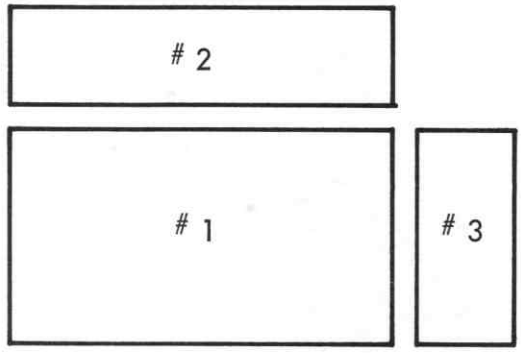
Material required: 3 colors of 4 ply yarn
crochet hook.

1. Cast on 40 sts. and knit 60 rows with color #1. Bind off with any method.

2. Cast on 40 sts. and knit 30 rows with color #2. Bind off with any method.

3. Cast on 20 sts. and knit 60 rows with color #2. Bind off with any method.

4. Join these 3 pieces with color #3 as follows:

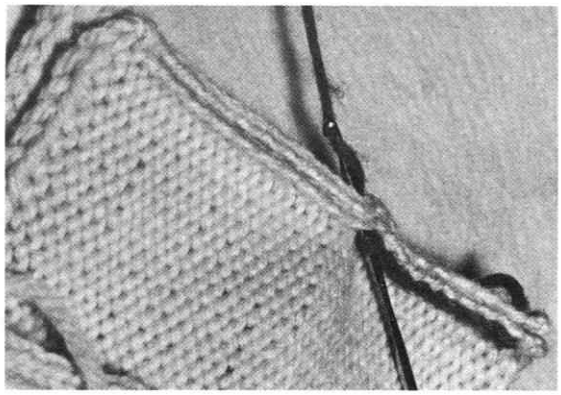


a. Seaming the Vertical Edges:

1) Line up the vertical edges of piece #1 and #3 with 2 right sides together

2) Make a loop as if to start a chain and insert the crochet hook into the 1st stitch of both pieces and make a slip stitch.

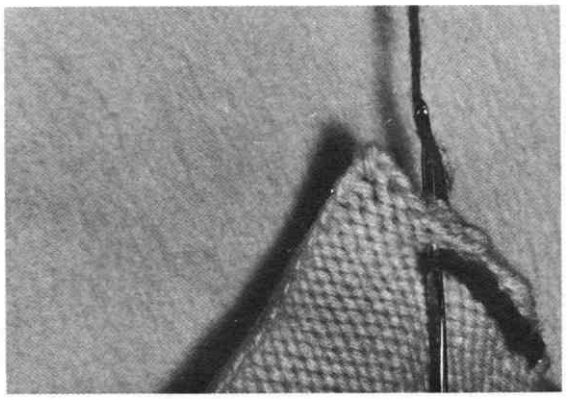
3) Keep making slip stitches as if making chains, inserting the crochet hook into both pieces to be joined. You may make these slip stitches with one full stitch seam allowance or one-half the edge stitch by going into the center of the edge stitch.

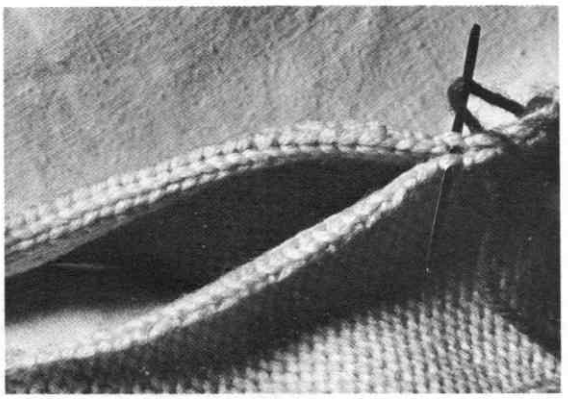


b. Seaming Along the Bound Edges:

1) Place the bound edges of piece #2 on top of that of piece #1 with 2 right sides together.

2) Slip crochet along the bound edges inserting the crochet hook into the needle loops below the binding.





SAMPLE NO. 76 -- Whipping

1. Cast on 16 sts. on E/O/N with "e" cast on and knit 40 rows.

2. Bind off with any method and remove from the machine.

3. Make another piece exactly as the 1st one.

4. Stretch both pieces lengthwise and block.

5. Lay 1 piece with the right side up. Lay the other one on top of the 1st piece with 2 knit sides together.

6. Thread the tapestry needle with a contrasting yarn.

7. Insert the tapestry needle into the loop on the edge of both pieces (from the back to the front). Pull through.

8. Skip the knot and insert the needle into the next loop on both pieces from the back to the front of the work. Pull through.

9. Continue to work in the same way until these pieces are joined.

Conclusion

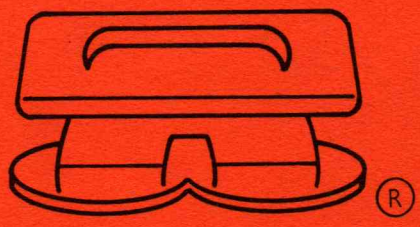
Now that you have finished making samples, you should have gained enough working knowledge and experience on your own knitting machine. You should be able to handle your own knitting machine well.

If you have any question in making garments and articles, refer to the samples of the similar type, change the number of stitches and rows to those of your own pattern.

If you have changed to a new machine and want to know the new one, go through the first chapter to get acquainted with your new machine. Use another color pencil to write all the information into the blank spaces provided.

If you are trying to make something in pattern work for the first time, and not too sure about certain techniques, make some samples of sections in question in the pattern stitch you are planning to use. In most cases, all you have to clarify will be how to get in and out of short rows, whether it be decreasing or increasing, and how to get in and out of free pass in which you slip the cam across without knitting.

By doing the above, most of your questions will be answered before you start your project. Now you are ready to pick up any pattern and knit confidently on your own knitting machine.

I hope I have covered enough of the basic techniques to answer most of your questions. In the next book, I hope to be able to go into other areas, such as pattern work, punch cards and charting. In the mean time, if you have any comment about this book or for the next one I would appreciate hearing from you. Please write to:

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